Statistics
Canada
Agriculture Division

Agriculture and Rural Working Paper Series
Working Paper No. 48

Intensive Livestock Farming: Does Farm Size Matter?

Prepared by
Martin S. Beaulieu, MSc, Analyst
Analysis and Development Section
martin.beaulieu@statcan.ca

Statistics Canada, Agriculture Division
Jean Talon Building, 12th floor
Tunney's Pasture
Ottawa, Ontario K1A 0T6

June 2001

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Published by authority of the Minister responsible for Statistics Canada.

Minister of Industry, 2001.

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June 2001

Catalogue No. 21-601-MIE01048

Frequency: Occasional

Ottawa

La version française est disponible sur demande (n° 21-601-MIF01048 au catalogue)

Note of appreciation: Canada owes the success of its statistical system to a longstanding partnership between Statistics Canada and the citizens, businesses and governments of Canada. Accurate and timely statistical information could not be produced without their continued co-operation and good will.

Highlights

The long-term trend in the Canadian livestock industry is towards a gradual decrease in the number of livestock farms and a steady increase in average farm size. Existing livestock farms and the new ones being established are becoming larger and more specialized. The production and the associated amounts of manure produced are also getting more concentrated in some regions. This is leading many people to wonder whether a production system based on large intensive operations is sustainable in the long run.

This paper investigates the relationship between livestock density within an area, farm intensity (number of animals per hectare at farm level) and farm size. Specifically, it answers the following question: Are large livestock farms solely responsible for the high concentrations of animals?

In order to explore this question further, livestock densities were studied using farm level data and characteristics—such as type of farm, operating arrangements and farm size—derived from the 1996 Census of Agriculture.

The report shows the following:

- In May 1996, 20% of Canada's livestock was found in areas with high concentrations of livestock (high-density areas).

- Livestock concentration is not necessarily linked to large livestock farms.

- Livestock in high-density areas were more likely to be along the feedlot alley in Alberta, small dairy and pig farms in Quebec and small dairy and beef cattle farms in Ontario.

- In high-density areas, there were relatively more livestock on farms owned by family corporations. However, livestock on non-family corporations were typically on very large farms.

- There were also more animals on farms that spread liquid or a combination of liquid and solid manure in high-density areas.

- In areas of high livestock concentrations, there were relatively more livestock on farms using more capital and less land to operate.

- Twelve percent of Canadian livestock were on very intensive farms. In Alberta's high-density areas, most of the livestock were on very large intensive farms while, in Quebec and Ontario, they were on relatively small less intensive farms. The cumulative impact of several non-intensive small farms may be comparable to the impact of a few large intensive farms.

Catalogue N°. 21-601-MIE00048

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Introduction and background

The long-term trend in the Canadian livestock industry is towards a gradual decrease in the number of livestock farms and a steady increase in average farm size. Existing livestock farms and the new ones being established are becoming larger and more specialized. The production and the associated amounts of manure produced are also getting more concentrated in some regions.

In addition to environmental and human health issues related to potential mismanagement of manure and contamination of water supply, livestock concentration also raises questions concerning animal health issues. It would be devastating if the foot-and-mouth disease should hit Canada's high livestock density areas (high-density areas).[1] This study provides a comprehensive description of livestock farming in Canada and should be useful to decision-makers in evaluating environmental policies for livestock farms.

This paper investigates the relationship between livestock density within an area, farm intensity (number of animals per acre at farm level) and farm size. Specifically, it answers the following questions: Are large livestock farms solely responsible for the high concentrations of animals? Is there a specific profile for these farms located in high-density areas?

To answer these questions, livestock densities were studied using farm level data and characteristics—such as type of farm, operating arrangements and farm size—derived from the 1996 Census of Agriculture.

The first step to measure livestock densities was to count all livestock[2]. The focus was not on specific types of livestock. The assumption is that it is the sum of all livestock that matters when measuring impact on the environment. For this reason, the livestock were added together regardless of type and weight.

Like apples and oranges, different things cannot always be added together. To create one grouping, an equivalency scale was used. Reported livestock inventories were transformed into an "animal unit". The smaller, lighter or younger the livestock are, the more animals are required to equal one animal unit. For instance, one animal unit would be equivalent to one cow, four sows or 125 broiler chickens. This concept is broadly used in regulations, codes of practice and municipal by-laws related to livestock production.

Animal units were calculated for all farms reporting livestock at May 14, 1996 Census of Agriculture.[3] The Census livestock enumeration included cattle, pigs, poultry, horses, sheep and lambs as well as more exotic animals such as emus, ostriches, elk, deer bison and wild boars.

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1. The disease has spread from Asia to Britain and to Europe over the last ten years. The last time foot-and-mouth disease was recorded in Canada (1952), nine thousand heads of cattle were destroyed in Saskatchewan. Lower livestock density in Saskatchewan may have restricted further spread of the disease.
2. For simplicity, the term 'livestock' is loosely used to include all animal farms, including poultry.
3. A census farm is an agricultural operation that produces at least one of the following products intended for sale: crops (field crops, tree fruits or nuts, berries or grapes, vegetables, seed); livestock (cattle, pigs, sheep, horses, exotic animals, etc.); poultry (hens, chickens, turkeys, exotic birds, etc.); animal products (milk or cream, eggs, wool, furs, meat); or other agricultural products (greenhouse or nursery products, Christmas trees, mushrooms, sod, honey, maple syrup products). For details, see Statistics Canada (1997), p.xxxi.

The next step was to find an indicator of concentration. It was given the term "livestock density". The concept is similar to population density, which indicates the number of people per square kilometre. But unlike people, who can be found everywhere, livestock can only be found in specific areas_farmland. For this reason, livestock density was measured by dividing the total number of animal units by the total area of farmland. Farmland includes the total of cropland, summerfallow and improved and unimproved pasture. Land that is not in agriculture and land on farms that is not suitable for manure disposal such as barnyards, laneways, woodlots and marshes[4] were excluded from the calculation.

The calculation was repeated for all farms located in a Census enumeration area. An enumeration area is the geographic area canvassed by one census representative. It is the smallest standard geographic area for which census data are reported. Canada's entire surface area is divided into enumeration areas.[5] Livestock density was measured in animal units per 100 hectares of farmland. One hundred hectares is equivalent to an area one kilometre by one kilometre.

It is not possible to derive the exact location of livestock using Census of Agriculture data. It was assumed that reported livestock were kept near the farm's headquarters. Animal units were assigned to the enumeration area of the headquarters.

As farming activities (i.e. manure disposal, pasture) of the farm headquarters located inside a particular enumeration area are likely to transcend the enumeration area boundaries, some adjustments were necessary. Weighted density averages were calculated by taking account of density values of neighbouring enumeration areas. [6]

Each enumeration area was then grouped into three different livestock density classes. Enumeration areas with less than 3 animal units per 100 hectares were grouped in the low-density class. Those with a density between 3 to 80 animal units were labelled as medium-density. Enumeration areas with a livestock density of more than 80 animal units were classified in the high-density class. [7]

In this paper, different characteristics were analysed to see if there was a specific profile for the livestock farms located in areas where animal concentrations were high. In each section, the distribution of livestock was first presented regardless of the livestock density, at both the national and the provincial level. Following that, the distribution in high-density areas was compared to the distribution in medium-density areas. A final step in the analysis focused on the distribution of livestock population located in high-density areas by farm size.

A specific characteristic was analysed in each section. The first two sections present results by type of farm and cattle operations. The following section investigates type of operating arrangement. A section is dedicated to the number of operators and the intensity of off-farm work. Then, the following two sections look at farm management practices (percentage of land rented, type of manure produced). The eighth section focuses on farm size (number of animals, farm area and capital value per farm). The final section discussion is on intensity of livestock farming.

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4. Also excluded are farm buildings, gardens, greenhouses, idle land, tree windbreaks, bogs, sloughs, etc.
5. For details, see Statistics Canada (1999b), pp.210-212.
6. For details, see Beaulieu et al. (2001).
7. For details, see Beaulieu et al. (2001).

Findings

1. Less than 20% of the animal units were on farms in high livestock density areas

As of May 14, 1996, there were over 13 million animal units in Canada. Alberta had the lion's share, followed by Ontario, Saskatchewan, Quebec and Manitoba.[8]

Over 80% of the animal units were located in areas where the density of livestock was not high. This represented close to 11 million animal units in medium-density areas. Less than one-fifth of animal units (18%) were on farms located in areas of high concentration of livestock (high-density areas).

In Quebec, nearly half of the animal units were on farms located in a high-density area. In British Columbia and Ontario, the ratio was about one in three (Table 1).

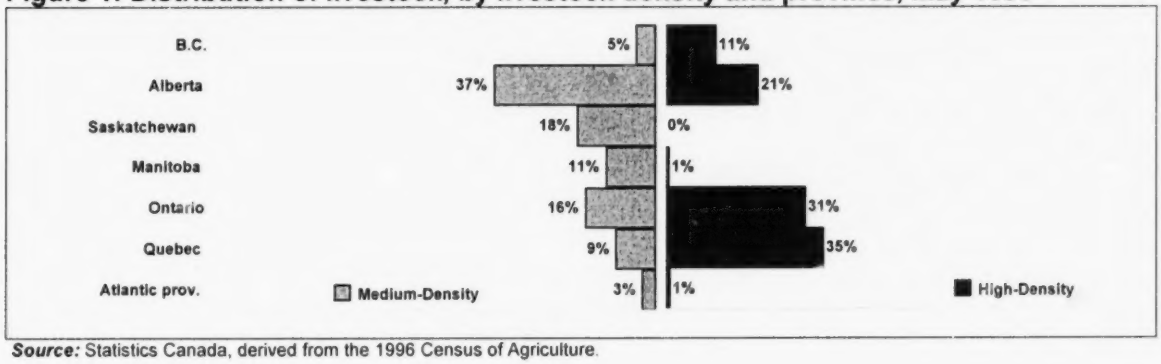
Table 1: Distribution of livestock, by province and livestock density, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Livestock density																
Low (less 3 AU/km2)	5.4	1	15.8	--	60.9	3	3.8	--	--	--	--	--	1.7	--	89.1	1
Medium (3-80 AU/km2)	496.7	63	4,043.5	89	1,977.2	97	1,248.9	98	1,748.7	70	1,005.9	54	340.3	92	10,861.0	81
High (over 80 AU/km2)	275.2	35	499.3	11	--	--	20.1	2	747.4	30	846.9	46	27.6	7	2,416.7	18
Exclusion (1)	8.4	1	4.2	--	1.1	--	1.5	--	1.1	--	--	--	1.4	--	18.0	--
All densities	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

Notes:
1. No density recorded. Excluded from the map to hide data that could be confidential.
-- too small to be expressed.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Most of the livestock in high-density areas were in Quebec, Ontario, Alberta and British Columbia. The largest percentage of livestock in medium-density areas was in Alberta, followed by Saskatchewan and Ontario (Figure 1).

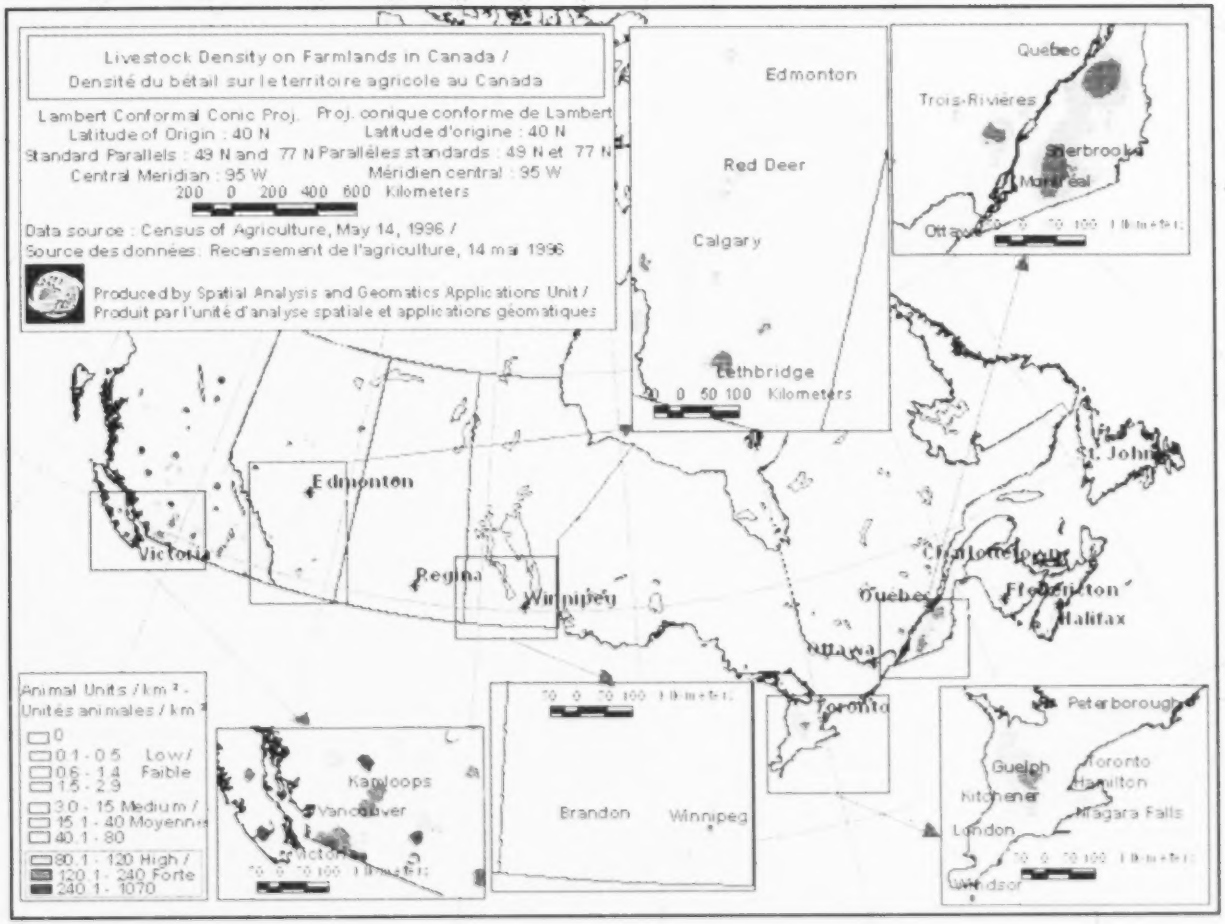
Figure 1: Distribution of livestock, by livestock density and province, May 1996



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

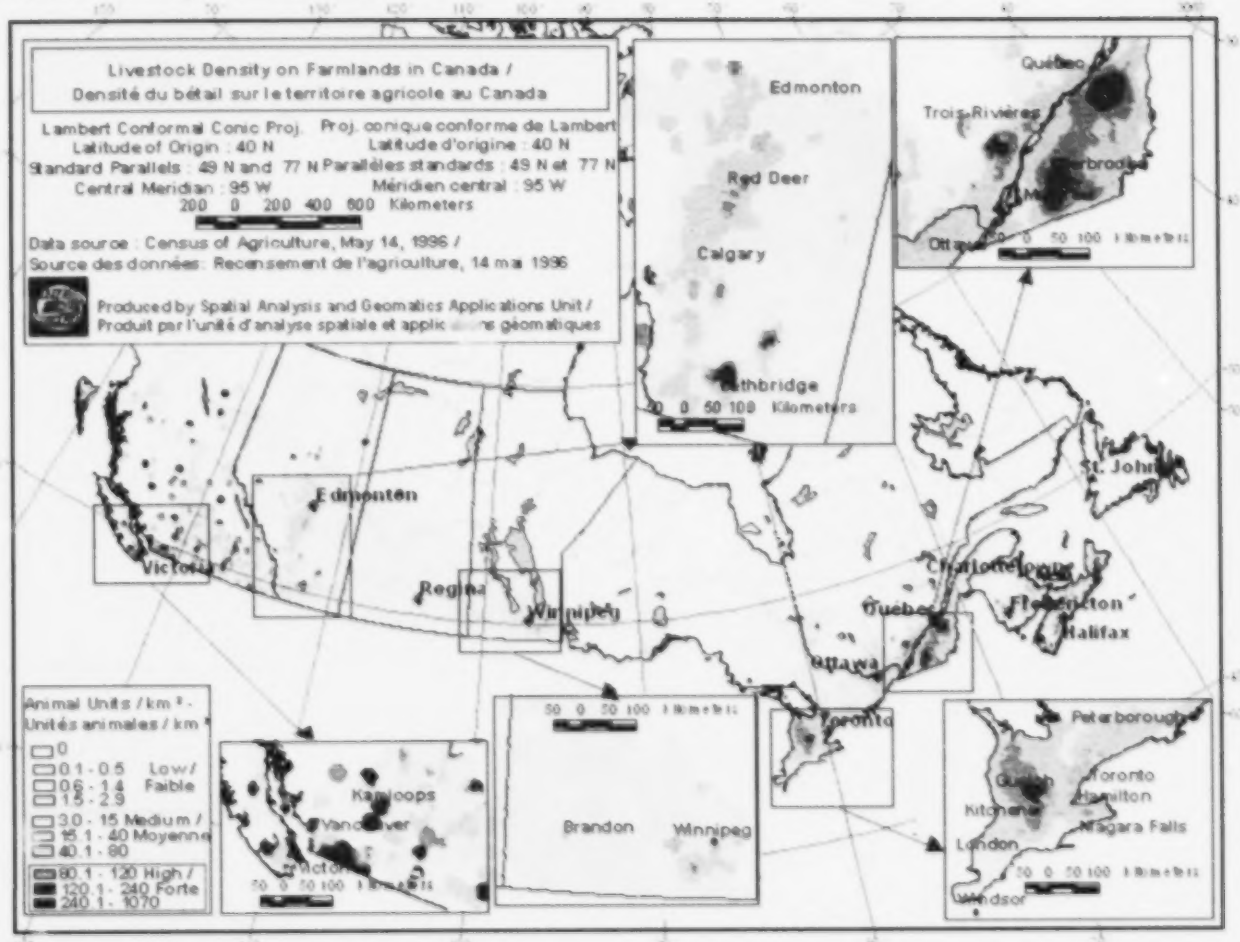
8. No adjustment was done to feeder cattle in Alberta feed lots. These animals may originate from somewhere else. They were likely born and raised up to feeder weight on cow-calf and/or on backgrounding operations elsewhere in Alberta or in other provinces. Such adjustment to 1996 data would be difficult as no breakdown for heifers was included.

Map 1: Livestock density, Canada, May 1996



Source: Beaulieu et al. 2001

Map 1: Livestock density, Canada, May 1996



Source: Beaulieu et al. 2001

2. Livestock in high-density areas were more likely to be on large beef farms in Alberta, small dairy and pig farms in Quebec, and small dairy and beef farms in Ontario

Each census farm was classified according to the predominant commodity produced. The commodity or group of commodities that accounts for 51% or more of the total potential receipts (gross income) determines the farm type.[9] The gross farm income from the sale of agricultural products, as reported by farmers on the Census, was not available by product sales. Thus, the main source of income was derived from other variables such as crop areas and number of livestock.

Most livestock on Canadian farms were raised on beef farms, followed by dairy, grain and oilseed and pig farms. Within each province, over 50% of all animals were on beef or dairy farms. The third largest group of livestock was on grain and oilseed farms in Saskatchewan and Alberta, followed by livestock on pig farms in Quebec, Ontario, Manitoba and Alberta. Most of the livestock on poultry farms were in Ontario and Quebec while animals on non-specialized farms (miscellaneous) were mainly in Alberta, Ontario and Manitoba (Table 2).

Table 2: Distribution of livestock by province and farm type, May 1996

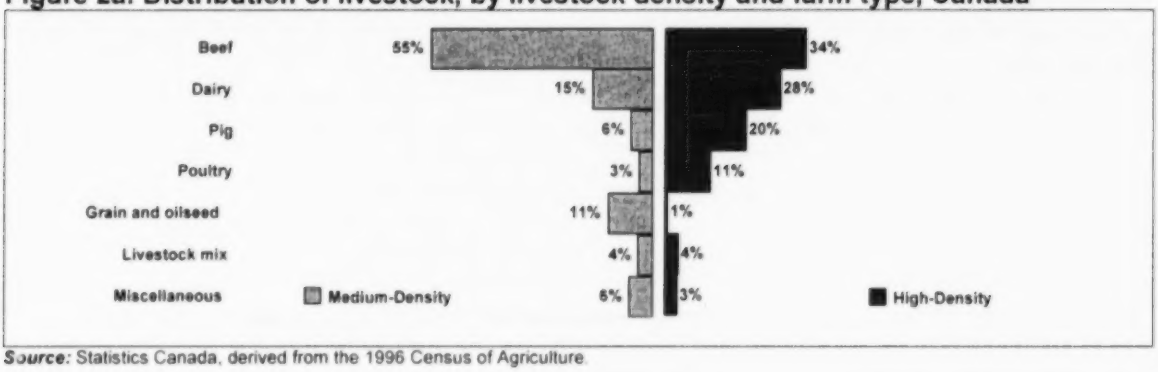
	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Farm type																
Beef	418.0	53	3,536.2	78	1,025.2	50	660.3	52	786.7	31	326.4	18	98.8	27	6,851.7	51
Dairy	159.3	20	175.7	4	55.8	3	103.3	8	809.6	32	868.8	47	126.9	34	2,299.3	17
Pig	18.0	2	147.3	3	63.1	3	170.2	13	272.1	11	387.6	21	35.5	10	1,093.8	8
Poultry	86.9	11	51.7	1	18.9	1	39.2	3	233.7	9	157.8	9	51.5	14	639.7	5
Grain & oilseed	12.6	2	250.9	5	695.6	34	148.4	12	102.5	4	24.7	1	20.7	6	1,255.4	9
Livestock mix	11.8	2	195.2	4	94.0	5	49.4	4	122.9	5	23.2	1	11.1	3	507.6	4
Miscellaneous	79.1	10	205.7	5	86.9	4	103.3	8	170.6	7	65.1	4	26.5	7	737.3	6
All types	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

Notes:
Farm type is based on major source of income.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

There were relatively more livestock on dairy, pig and poultry farms in high-density areas compared with livestock on the same type of farm in medium-density areas (Figure 2a). Hog and poultry farms and to a lesser extent dairy farms have traditionally been associated with enterprises that purchased their feed grains. Thus, they are able to operate on less land. Livestock on grain and oilseed and non-specialised farms (miscellaneous) were less likely to be in areas where there was a large concentration of livestock. This may suggest that farms raising livestock in high-density areas were relatively more specialized in livestock farming than those located in medium-density areas.

[9] For details, see Statistics Canada (1997), p.xxxiii.

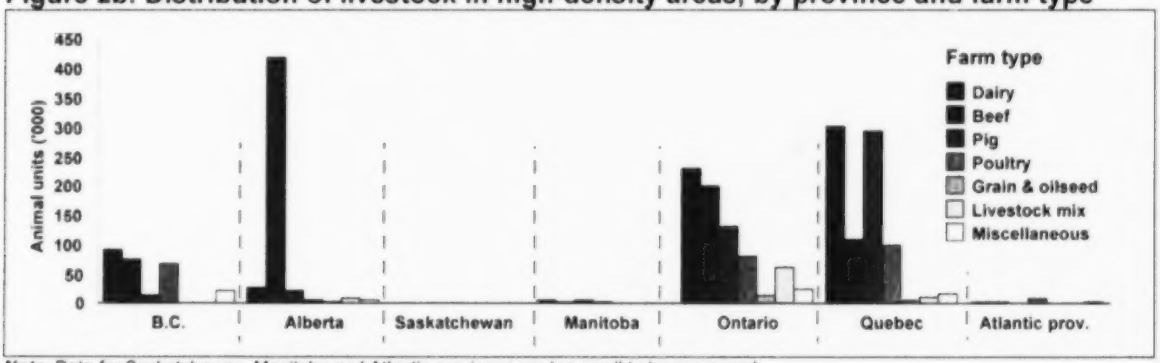
Figure 2a: Distribution of livestock, by livestock density and farm type, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

At the provincial level, the majority of livestock in high-density areas was on beef farms in Alberta, followed by livestock on dairy and pig farms in Quebec, and beef and dairy farms in Ontario (Figure 2b).

Figure 2b: Distribution of livestock in high-density areas, by province and farm type



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

A detailed table by farm size is presented in Appendix C Table C1. Livestock in Alberta's high-density areas were mainly on very large farms (over 400 animal units). In Quebec and Ontario, they were essentially on relatively smaller farms (less than 200 animal units).

3. Cattle in high-density areas were mainly on dairy and feedlot operations

In the previous section, farm type was established based on the main source of gross farm income. A specific type of farm (based on farm income) may raise more than one type of animal. The following analysis focuses on cattle as they represented the largest group of livestock.

The type of cattle operation was defined using the mix of cattle by age group and sex. An algorithm was used on the Census data to classify each cattle operation in one specialization.[10] Livestock operations reporting cattle and calves were classified as dairy, cow-calf, feed operations or other beef farms.

With over half of the cattle animal units, cow-calf operation was the predominant group. They were mainly found in Alberta, Saskatchewan, Manitoba and Ontario. Dairy farms were second in terms of the number of cattle. Most of them were in Quebec and Ontario. Cattle on feedlots were concentrated in Alberta and Ontario (Table 3).

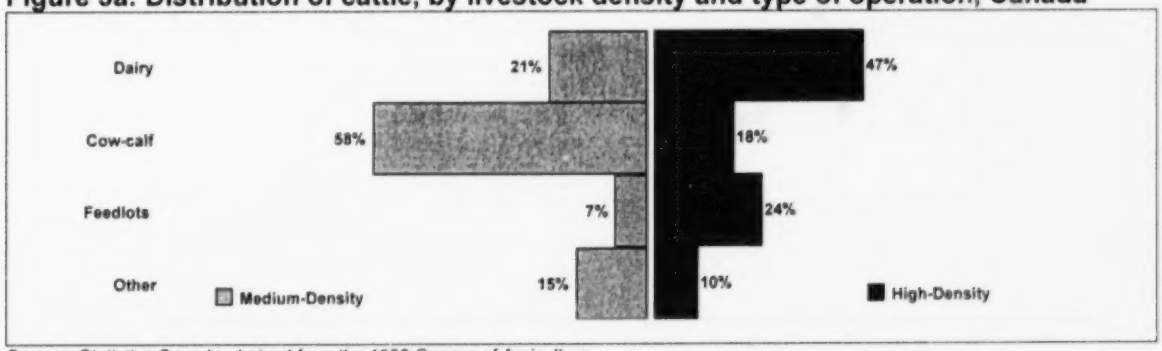
Table 3: Distribution of cattle, by province and type of cattle operation, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Cattle operation type																
Dairy	162.0	27	292.5	7	95.1	5	135.3	14	887.8	49	917.0	72	139.5	52	2,629.1	24
Cow-calf	325.6	55	2,399.1	59	1,422.5	78	620.2	66	465.9	26	274.4	22	79.1	30	5,586.8	52
Feedlots	15.5	3	615.2	15	63.6	3	44.0	5	230.0	13	37.9	3	15.0	6	1,021.2	9
Other	89.9	15	748.8	18	244.8	13	139.3	15	222.5	12	42.9	3	33.9	13	1,522.0	14
Total	593.0	100	4,055.6	100	1,826.0	100	938.7	100	1,806.3	100	1,272.2	100	267.4	100	10,759.1	100

Note: Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

In high-density areas, there was a higher percent of cattle on dairy and feedlot farms than in medium-density areas. Almost 60% of all cattle in medium-density areas were on cow-calf farms (Figure 3a).

Figure 3a: Distribution of cattle, by livestock density and type of operation, Canada

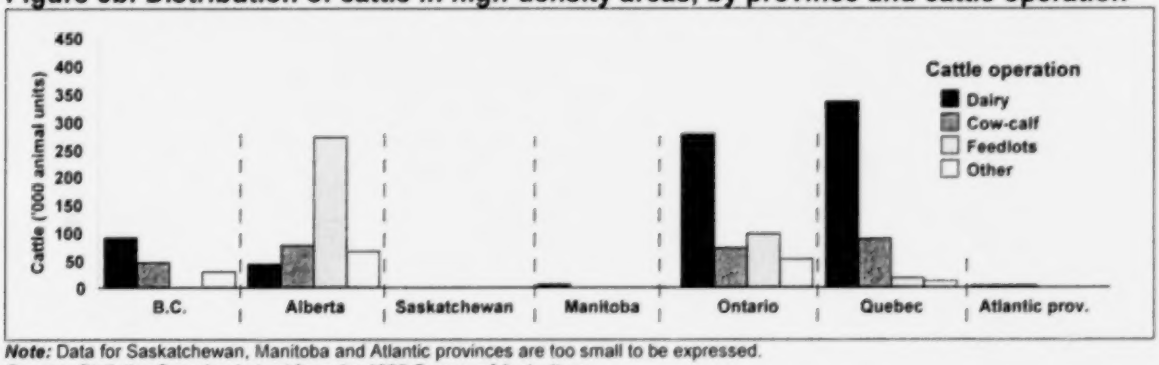


Source: Statistics Canada, derived from the 1996 Census of Agriculture.

[10] For details, see Appendix A.

Most of the cattle in high-density areas were on dairy farms in Quebec and Ontario, followed by cattle on feedlot operations in Alberta (Figure 3b). As Saskatchewan and Manitoba were mainly specialized in cow-calf and backgrounding operations, the cattle herd in high-density areas is not as large in these two provinces.

Figure 3b: Distribution of cattle in high-density areas, by province and cattle operation



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

A table by farm size is presented in Appendix C Table C2. It indicates that cattle in Quebec and Ontario's high-density areas were mainly on small dairy farms (less than 200 animal units). In Alberta, they were mostly on very large feedlot operations (over 400 animal units).

4. Livestock in high-density areas were mostly on farms owned by family corporations

In this section, livestock was distributed by type of operating arrangement. Operating arrangement was self-reported by farmers on the Census questionnaire. Farms were grouped in four categories: sole proprietor, family corporation, non-family corporation and other types. The "other types" category includes arrangements such as written or non-written partnership, institution, community pasture, Hutterite colony, trust or estate.

At the national level, most of the livestock were on farms owned by one proprietor (43%). The second and the third largest groups were other types and family corporations. Non-family corporations held 6% of the total livestock population. Compared with national percentages, Quebec and British Columbia had relatively more livestock on farms owned by family corporations and less livestock on farms owned by a sole proprietor. In Manitoba and Saskatchewan, it was the opposite (Table 4).

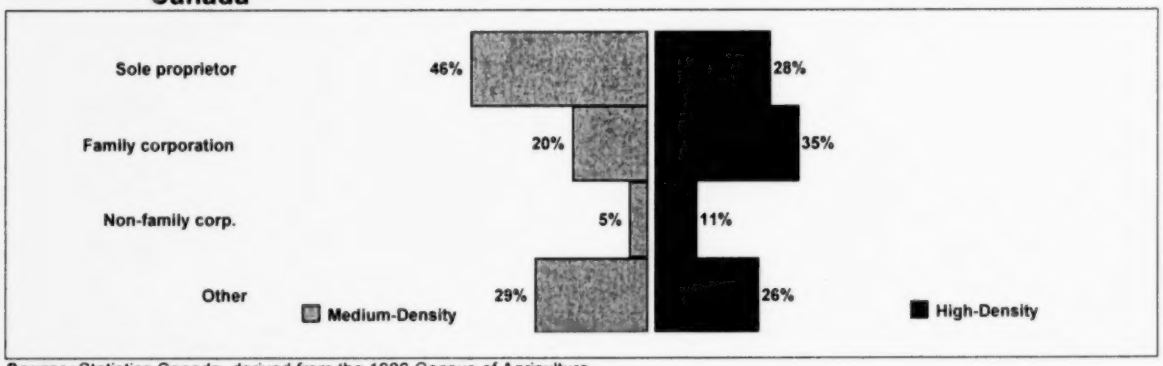
Table 4: Distribution of livestock, by province and operating arrangement, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Operating Arrangement																
Sole proprietor	211.1	27	1,917.7	42	1,188.3	58	609.3	48	1,021.4	41	612.9	33	181.4	49	5,741.9	43
Family corporation	294.3	37	1,119.6	25	232.3	11	167.9	13	557.4	22	543.4	29	93.9	25	3,008.7	22
Non-family corporation	55.2	7	317.6	7	67.3	3	92.2	7	73.5	3	178.2	10	12.5	3	796.5	6
other	225.0	29	1,207.8	26	551.6	27	404.8	32	845.8	34	519.2	28	83.3	22	3,837.6	29
Total	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

Note: Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Distribution of livestock in medium-density areas was very similar to the national distribution (regardless of density). In high-density areas, there were relatively more livestock on farms owned by family and non-family corporations compared with livestock on these types of farm in medium-density areas. There were also relatively fewer livestock on farms with a sole proprietor (Figure 4a).

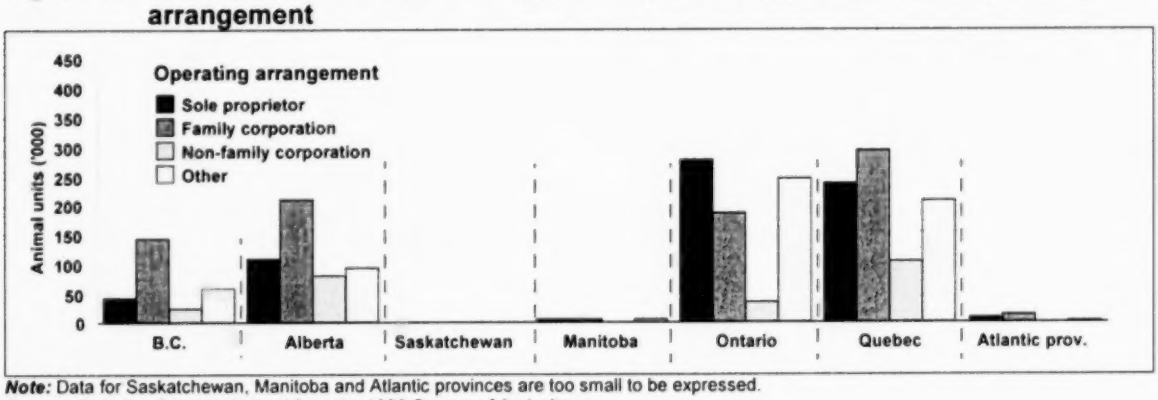
Figure 4a: Distribution of livestock, by livestock density and operating arrangement, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

In high-density areas, livestock on farms owned by family corporations were mainly in Quebec, Alberta and Ontario. The second largest group (livestock on farms with a sole proprietor) was found in Ontario and Quebec (Figure 4b).

Figure 4b: Distribution of livestock in high-density areas, by province and operating arrangement



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Further analysis by farm size indicates that in high-density areas, livestock on farms owned by family corporations in Alberta were essentially on very large operations (over 400 animal units). Livestock on farms owned by one person in Ontario and Quebec were primarily on very small farms (less than 100 animal units). Livestock owned by non-family corporations were typically on very large farms (see Appendix C Table C3).

5. Livestock in high-density areas were mostly on farms run by one full time operator

A Census farm operator is defined as a person responsible for the day-to-day management decisions made on the farm. The Census of Agriculture collected information on the amount of time each contributed to the farm and off-farm work (being employed or running a business other than farming). Three categories were created to classify farms by the intensity of off-farm work. These groups were defined according to the average number of hours per week that at least one operator spent working off-farm.

At the national level, over half the livestock were on farms run by one operator and one-third were on farms run by two operators. Within each province, livestock distributions were similar with a few exceptions. In Quebec and British Columbia, the majority of livestock was on farms run by more than one operator. In all provinces, over 74% of animals were on farms where little off-farm work was done. Ten percent were on farms where at least one operator worked off-farm for more than 40 hours per week (Table 5).

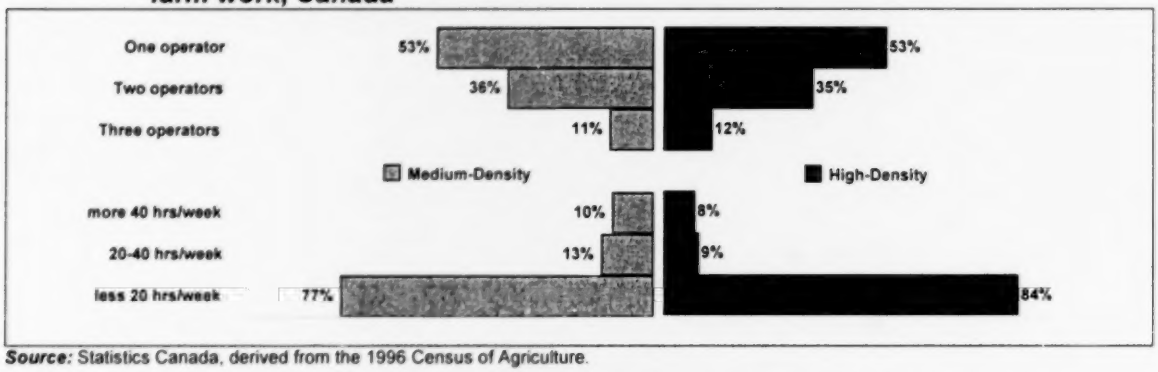
Table 5: Distribution of livestock, by province, number of operators and off-farm work, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Number of operator																
One	379.1	48	2,539.3	56	1,233.1	60	696.1	55	1,249.1	50	824.3	44	223.4	60	7,144.3	53
Two	313.4	40	1,569.4	34	632.9	31	428.5	34	969.3	39	763.6	41	108.8	29	4,785.9	36
Three	93.2	12	454.0	10	173.5	9	149.6	12	279.7	11	265.8	14	38.9	10	1,454.6	11
Intensity of off-farm work																
more 40 hrs/week	97.6	12	467.8	10	187.6	9	121.3	10	271.0	11	115.4	6	38.5	10	1,299.2	10
20-40 hrs/week	109.9	14	529.7	12	250.2	12	169.4	13	318.8	13	181.0	10	46.4	13	1,605.5	12
less 20 hrs/week	578.1	74	3,565.2	78	1,601.8	79	983.4	77	1,908.2	76	1,557.3	84	286.1	77	10,480.1	78
All	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

Note: Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

The distribution of livestock by the number of operators or by the intensity of off-farm work is very similar whether the animals were located on farms in medium or high-density areas (Figure 5a).

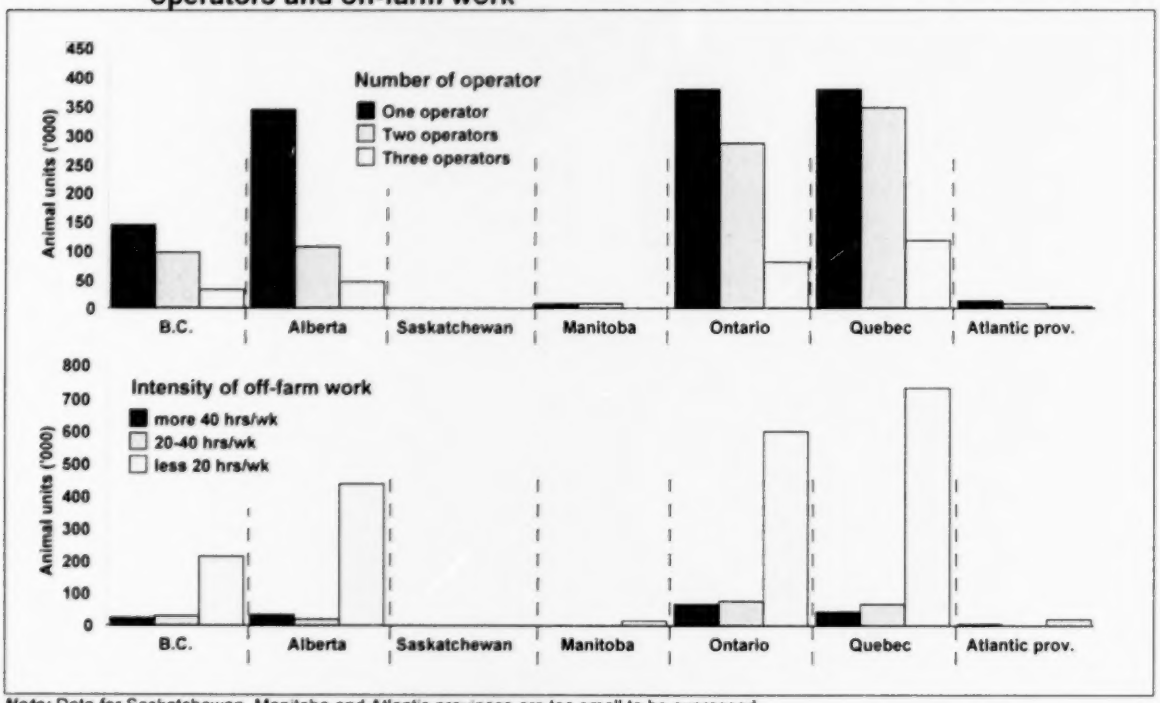
Figure 5a: Distribution of livestock, by livestock density, number of operators and off-farm work, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Within each province, the distributions of livestock in high-density areas were similar to the distributions in table 5 (regardless of livestock density). The more noticeable exception was in Alberta's high-density areas where there were relatively more animals on farms run by one operator (Figure 5b).

Figure 5b: Distribution of livestock in high-density areas, by province, number of operators and off-farm work



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Appendix C Tables C4 and C5 present information by farm size. Over half of Alberta's livestock in high-density areas was on very large farms (over 400 animal units) run by one operator. In Ontario, nearly 40% of livestock were on small farms (less than 200 animal units) run by one operator. Thirty percent of Quebec and Ontario livestock in high-density areas were on small farms run by two operators.

6. In high-density areas, most of the livestock were on farms that operate on owned land

Ownership of land is reported on the Census of Agriculture questionnaire. Farmers reported area of land owned, rented and leased from governments or other agencies.

At the national level, almost half of all livestock were on farms renting less than 10% of land from someone else. One-fifth of animals (22%) was on farms where over 50% of land was rented. In each province similar distributions were observed except in Quebec and Saskatchewan. In Quebec, there were many livestock on farms that reported renting a small part of their land. In Saskatchewan, it was the opposite (Table 6).

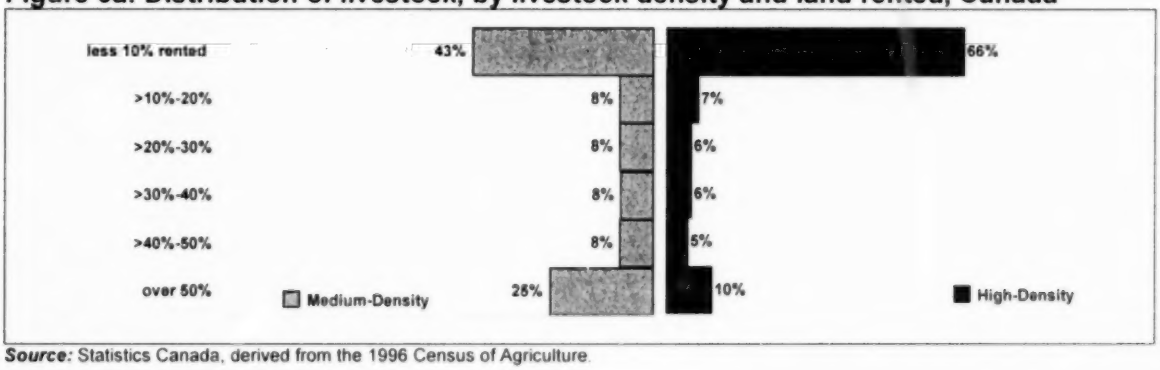
Table 6: Distribution of livestock, by province and percent of land rented, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
Land rented	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
less 10%	412.2	52	1,905.2	42	684.4	34	535.9	42	1,277.0	51	1,301.4	70	196.9	53	6,313.1	47
>10%-20%	45.9	6	364.5	8	170.4	8	105.5	8	196.6	8	138.0	7	42.9	12	1,063.8	8
>20%-30%	44.3	6	359.3	8	183.1	9	113.7	9	198.6	8	109.9	6	32.8	9	1,041.8	8
>30%-40%	48.0	6	360.0	8	179.8	9	108.2	8	185.3	7	92.2	5	28.1	8	1,001.7	7
>40%-50%	55.0	7	374.2	8	189.7	9	105.5	8	182.6	7	78.0	4	20.3	5	1,005.3	8
over 50%	180.3	23	1,199.4	26	632.1	31	305.3	24	457.8	18	134.1	7	50.2	14	2,959.1	22
All	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

Note: Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Compared with medium-density areas, high-density areas displayed fewer livestock on farms where over 50% of land was rented. Two-thirds of the animals in high-density areas were on farms largely owned by the operator (less than 10% rented) (Figure 6a).

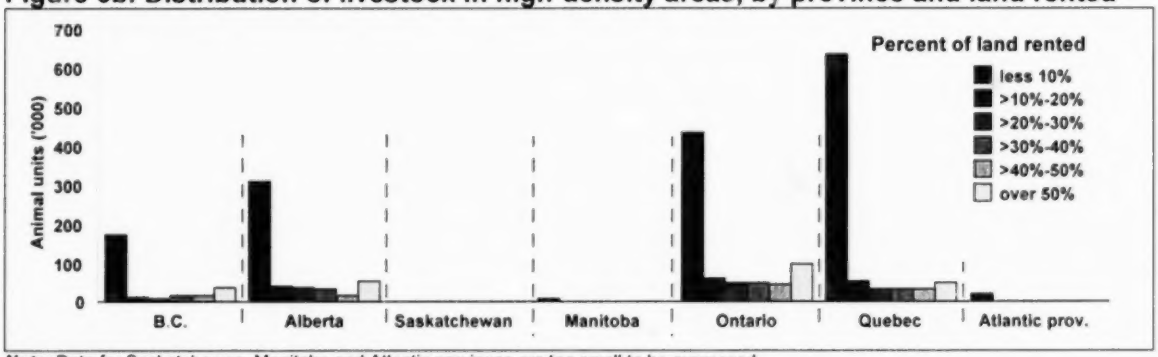
Figure 6a: Distribution of livestock, by livestock density and land rented, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Figure 6b shows the provincial distributions of livestock in high-density areas. The provincial and national distributions were all very similar. Livestock were mainly on farms operated by farmers who owned most of their land (Figure 6b).

Figure 6b: Distribution of livestock in high-density areas, by province and land rented



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Appendix C Table C6 presents results by farm size. In Quebec and Ontario, animals were mainly on small farms (less 200 animal units) that rented less than 10% of their land. In Alberta, most of the animals were on very large farms (over 400 animal units). Operators of these large farms owned most of their land (less than 10% rented).

7. In high-density areas, there were relatively more livestock on farms producing liquid manure

On the Census of Agriculture questionnaire, farmers reported the area of land on which manure was applied and the method of application. The manure application methods were grouped into four categories (solid spreader, irrigation, liquid and combination). The combination category was used if more than one method was reported. This was likely to occur on farms raising a mix of livestock such as cows and pigs. These farms would have to produce both solid and liquid manure.

There were two limitations with the Census questions. The first one was the reference period. In 1996, farmers were asked to report areas on which manure was applied in 1995. The composition and size of their herds in 1996 may have differed from the number of animals on their farms in 1995 (the basis of the manure application). The second limitation is the origin of manure. A farmer may have reported solid manure produced from the farm. The farmer may have also reported liquid manure applied to the land but produced by a neighbouring farm. Thus, the combination category does not necessarily mean that the farm produced both types of manure. For simplicity, it was assumed that they produced both.

Two-thirds of all livestock were on farms where solid manure was applied. This was expected as cattle were the most numerous type of livestock. Traditionally, cattle farms produce solid manure. In provinces where pig production was important (Quebec, Ontario, Manitoba and British Columbia), there were relatively more livestock on farms spreading liquid or a mix of liquid and solid manure (Table 7).

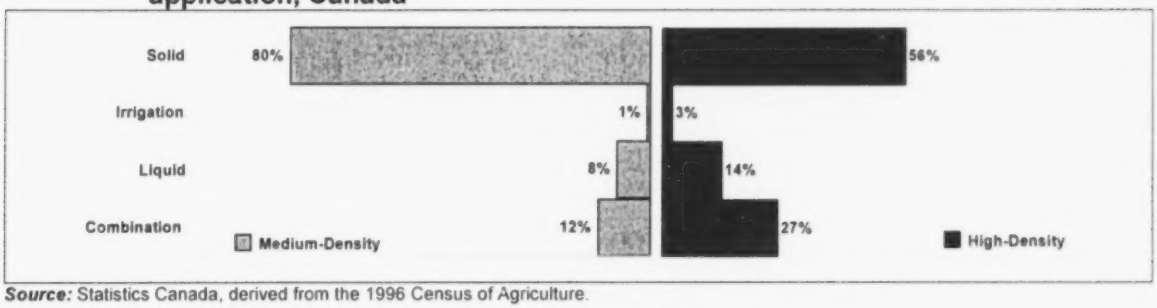
Table 7: Distribution of livestock, by province and method of manure application, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Manure application																
Solid	283.9	66	2,491.7	86	1,052.2	91	649.8	77	1,474.0	68	835.4	54	233.5	74	7,020.5	75
Irrigation	--	--	13.8	--	4.3	--	14.9	2	53.2	2	35.1	2	--	--	125.6	1
Liquid	61.4	14	128.0	4	47.6	4	95.3	11	199.7	9	272.7	18	34.2	11	838.8	9
Combination	81.1	19	259.2	9	53.9	5	86.8	10	450.9	21	406.7	26	45.1	14	1,383.6	15
All	429.9	100	2,892.7	100	1,158.1	100	846.9	100	2,177.8	100	1,549.8	100	313.5	100	9,368.6	100

Notes:
-- too small to be expressed.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

In high-density areas, there were relatively more animals on farms that spread liquid or a combination of liquid and solid manure compared with medium-density areas. This is likely associated with the relatively large number of pig farms (or mixed dairy-pig farms) in high-density areas. Traditionally, pig farms produce liquid manure (Figure 7a).

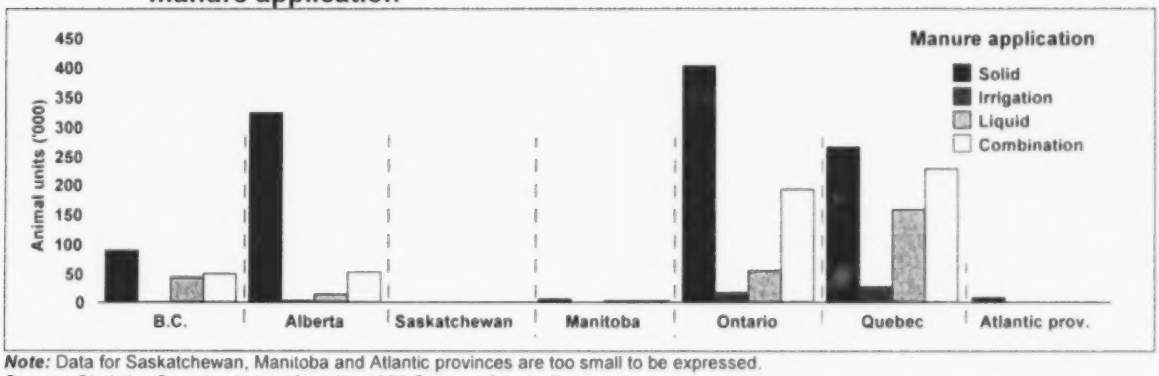
Figure 7a: Distribution of livestock, by livestock density and method of manure application, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

In high-density areas, the livestock on farms spreading liquid manure (or combination of liquid and solid) were mainly in Quebec, Ontario and British Columbia. Animals on farms where solid manure was applied were primarily in Ontario, Alberta and Quebec (Figure 7b). This is consistent with the type of farms and livestock found in these provinces. Cattle on feedlot operations were dominant in Alberta's high-density areas. Cattle and pigs were both important in Quebec. Cattle in Ontario were the most predominant type of animals found in high-density areas.

Figure 7b: Distribution of livestock in high-density areas, by province and method of manure application



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Appendix C Table C7 displays results by farm size. In high-density areas, one third of the livestock were on small farms (less than 200 animals units) producing solid manure. Conversely in Alberta, livestock were mainly on very large farms (over 400 animal units).

Small farms, where both liquid and solid manure was applied, were the second most likely place to find large number of animals. For farms where liquid manure was the only form of manure applied, there was no difference among different farm size groups.

8. Livestock in Quebec and Ontario high-density areas were mostly on small farms while they were mostly on very large farms in Alberta

In this section, the distribution of livestock was analysed by farm size. The first indicator relates to the number of animal units per farm. Livestock were grouped in five categories: very small farms (less than 100 animal units), small farms (100-199 animal units), medium farms (200-299 animal units), large farms (300-399 animal units), and very large (400 animal units and more).

The second farm size indicator used total farm area reported by farmers on the Census of Agriculture questionnaire. Six groups were created: farms with less than 100 acres, 100-274 acres, 275-699 acres, 700-1,499 acres, 1,500-2,249 acres, and 2,250 acres and more.

The third indicator of farm size groups livestock using the value of land and buildings. Capital value of livestock or production quotas could have been considered; however, this would have made comparison more difficult. Some farms may have a lot of capital invested in pure bred, breeding animals or production quotas. This type of asset can be easily transferred between farms located in different areas. Land and building assets are immovable assets. For analytical purposes, six categories were created: farms with less than $150 thousand in land and buildings, $150-249 thousand, $250-499 thousand, $500-849 thousand, $850-1,249 thousand, and $1.25 million and more.

At the national level, over half of all livestock were on small farms (less than 199 animal units, less than 700 acres and less than $500 thousand in land and buildings). One-fifth of farm animals (21%) was on very large farms (over 400 animal units, over 2,250 acres and over $1.25 million).

Within each province, distributions were similar, particularly in Central and Eastern provinces. There were relatively more animals on small farms and fewer on very large farms. This observation was valid for all three indicators except in Ontario. In this province, higher land value may explain why there were relatively more livestock on farms with high land and building values. Ontario is more populated. This would increase competition for land uses other than agriculture use, driving up land value.

In Alberta, compared with national percentages, there were relatively fewer livestock on small farms and more animals on very large farms. In British Columbia, there were relatively fewer animals on small farms (less 200 animal units). However, there were relatively more livestock on very small areas (farms with less than 100 acres) with high land and building values (over $1.25 million). Greater competition for land use, due to limited amount of land available to agriculture, may explain higher capital value and concentration of livestock on a smaller farmland base.

Saskatchewan and Manitoba were similar. In terms of animal units, their share of livestock on small and very large farms was close to the national percentages. They had relatively fewer livestock on farms of small area (less than 275 acres). Relatively more livestock were on farms of less than $500 thousand in land and buildings. Low population density, greater availability of agricultural land, and predominance of grain production in these two provinces may explain, in part, lower land values and farms with larger land areas (Table 8).

Table 8: Distribution of livestock, by province, farm size, farm area and value of land and buildings, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Farm size (animal units)																
1-99	212.3	27	1,111.4	24	805.8	40	441.0	35	1,216.3	49	896.9	48	171.3	46	4,855.0	36
100-199	175.5	22	1,034.2	23	566.7	28	349.6	27	712.2	29	501.9	27	99.2	27	3,439.1	26
200-299	119.8	15	541.4	12	237.8	12	166.7	13	226.4	9	165.0	9	41.0	11	1,498.0	11
300-399	73.4	9	309.1	7	116.2	6	82.4	6	106.0	4	86.5	5	21.5	6	795.2	6
400 & over	204.6	26	1,566.6	34	313.1	15	234.5	18	237.2	9	203.4	11	38.2	10	2,797.5	21
Farm area (acres)																
1-99	217.3	28	152.7	3	52.8	3	104.4	8	378.9	15	324.8	18	59.5	16	1,290.4	10
100-274	132.1	17	408.4	9	83.7	4	99.5	8	906.4	36	677.1	37	99.5	27	2,406.7	18
275-699	109.1	14	1,021.5	22	277.2	14	257.8	20	849.1	34	679.5	37	151.4	41	3,345.6	25
700-1,499	104.1	13	1,096.4	24	539.3	26	369.0	29	281.7	11	150.5	8	48.6	13	2,589.6	19
1,500-2,249	47.3	6	536.6	12	410.2	20	172.2	14	51.8	2	17.9	1	8.2	2	1,244.4	9
2,250 & over	175.8	22	1,347.1	30	676.3	33	271.3	21	30.1	1	3.8	--	3.7	1	2,508.1	19
Value land and buildings (000$)																
under 150	50.1	6	335.3	7	293.4	14	235.8	19	171.3	7	299.2	16	60.6	16	1,445.7	11
150-249	63.3	8	428.8	9	294.9	14	213.1	17	308.3	12	362.2	20	60.3	16	1,730.9	13
250-499	148.4	19	946.8	21	622.4	31	364.9	29	734.9	29	564.1	30	107.1	29	3,488.6	26
500-849	159.6	20	912.7	20	427.5	21	194.9	15	560.8	22	355.0	19	72.9	20	2,683.4	20
850-1,249	110.1	14	586.4	13	173.4	9	83.8	7	273.5	11	140.1	8	38.6	10	1,406.0	11
1,250 & over	254.1	32	1,352.7	30	228.0	11	181.6	14	449.2	18	133.0	7	31.5	8	2,630.2	20
All	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

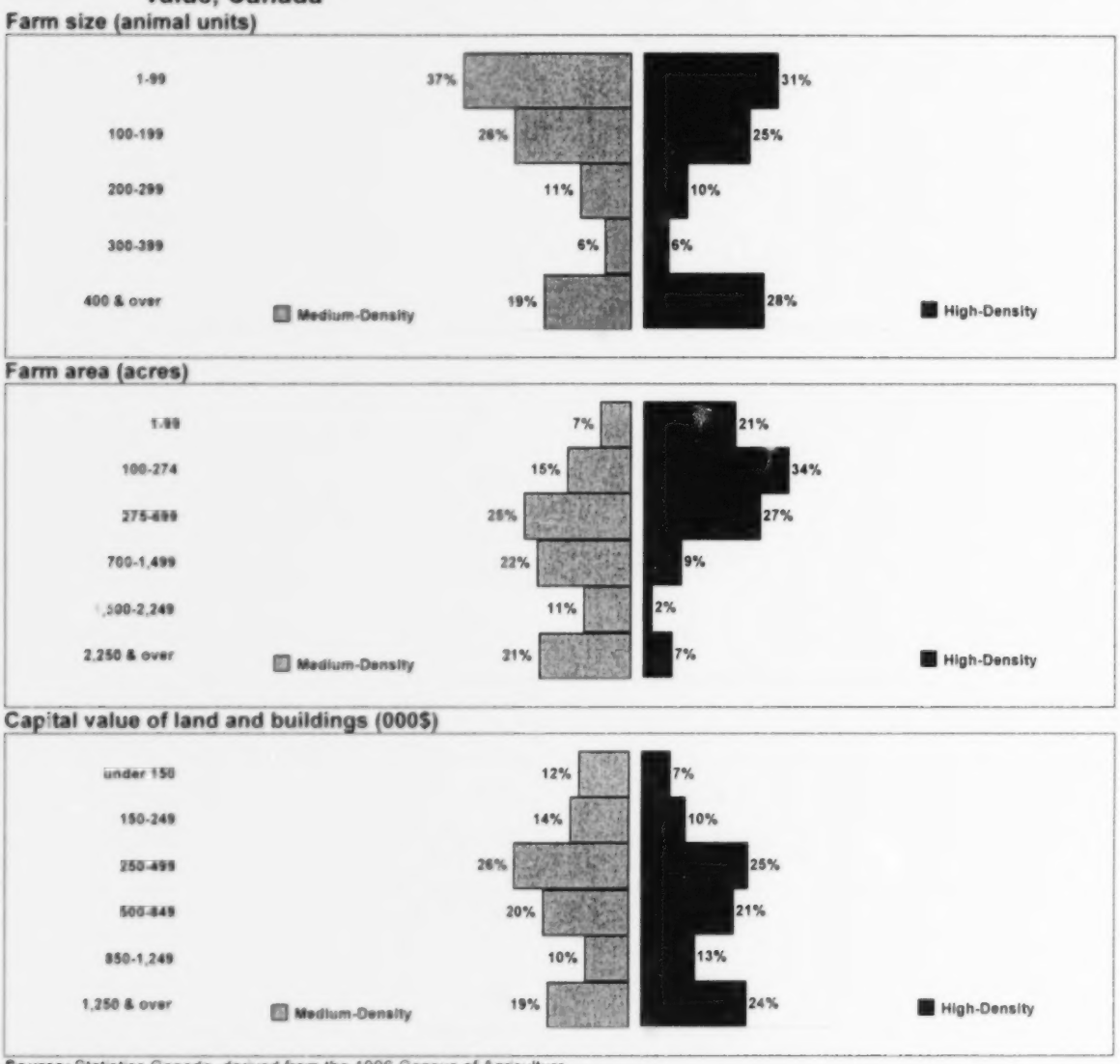
Notes:
-- too small to be expressed.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture

At the national level, the percentage of livestock on very large farms (over 400 animal units) stood at 28% in high livestock density areas compared with 19% in medium-density areas. There were also relatively fewer animals on very small farms (less 100 animal units). The very small farms, however, accounted for almost one-third (31%) of all livestock in high-density areas compared with 37% in medium-density areas.

In terms of farm area, 55% of livestock in high-density areas were on small farms (less 275 acres) compared with 22% in medium-density areas. In high-density areas, livestock farms were less land intensive as less land was used to raise a greater number of animals.

In terms of land and building values, almost 25% of livestock were on very large farms (over $1.25 million) compared with 19% in medium-density areas. Livestock farms in high-density areas were more capital intensive, meaning more capital was used per animal (Figure 8a).

Figure 8a: Distribution of livestock, by livestock density, farm size, farm area and capital value, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

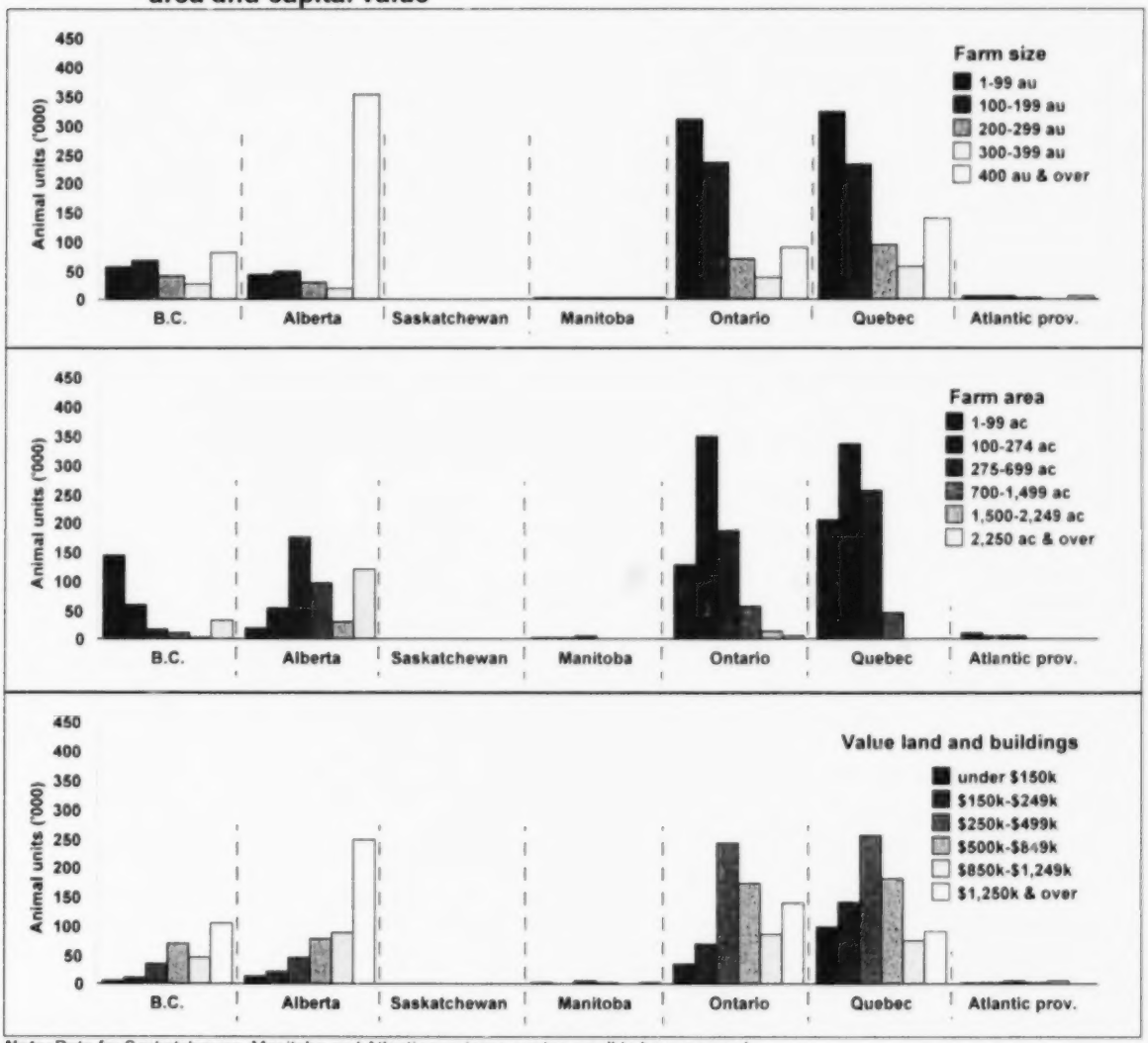
At the provincial level, over 44% of Quebec and Ontario livestock located in high-density areas were on farms with less than 199 animal units on less than 275 acres. Over 37% of them were on farms valued between $250 thousand to $1.25 million in land and buildings.

The third largest group in high-density areas was in Alberta. Most of the animals (over 40%) were on very large farms (over 400 animal units), highly capitalized farms (over $1.25 million in land and buildings) and operating on more than 700 acres.

In British Columbia, over 40% of livestock in high-density areas were on farms having less than 199 animal units and 275 acres. Almost a third of them were on farms with land and buildings valued between $250 thousand to $1.25 million (Figure 8b and Appendix C Tables C8 to C10).

Indicators of farm size alone may not be sufficient to explain higher concentrations of livestock. Large or small farms may use capital and land intensively. The next section looks at the intensity of livestock farming.

Figure 8b: Distribution of livestock in high-density areas, by province, farm size, farm area and capital value



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture

9. In Alberta high-density areas, most of the livestock were on very large intensive farms while in Quebec and Ontario, they were on small less intensive farms

There are several ways to define farming intensity. Farming intensity is related to farm area. A farm is intensive if large amounts of inputs (fertilizer, pesticides, etc.) are used per area or large quantities are produced (tonnes of grain, number of livestock) per area. In Canada, there is no common definition used to describe an intensive livestock operation among provinces. Definitions, found in codes of practices, regulations or municipal by-laws, are adapted to local conditions and agricultural practices. For example, in Alberta, a livestock operation is defined as intensive when it holds more than 300 animal units in a confined location for more than 90 consecutive days. In Ontario, a livestock farm is considered intensive when it has over 150 animal units or has more than two animal units per acre of tillable land.

Using the number of animal units per farm is not sufficient to define a farm as being intensive or not. A farm could be large but not very intensive, (e.g. a cattle ranch on large farm area). A small farm may also be intensive if it is operated on a small area (e.g. pig, poultry farms or cattle feedlots). Traditionally, these types of operations purchase most of their feed grains. Thus, they are able to operate on very little land.

For this study, the indicator of intensity used is the number of animal units per tillable area. Tillable area includes cropped areas, summerfallow, improved and unimproved pastures.

The measure of livestock intensity is very much like measuring livestock density for a whole region. Instead of measuring livestock density at the regional level (which includes several farms), intensity is measured for each farm. It is equivalent of measuring livestock density at the farm level.

In 1996, twelve percent of Canadian livestock were on very intensive farms (over 2 animal units per acre of tillable land). Alberta had the lion's share. In decreasing order, the other provinces with substantial number of livestock on intensive farms were Quebec, Ontario and British Columbia (Table 9).

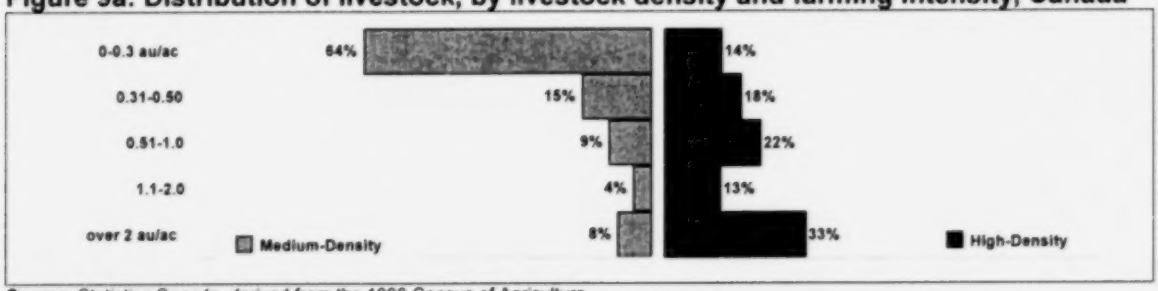
Table 9: Distribution of livestock, by province and farming intensity, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Farming intensity (animal units per tillable acre)																
0-0.30	346.2	44	2,907.4	64	1,819.9	89	963.9	76	761.0	30	425.5	23	101.7	27	7,325.6	55
0.31-0.50	76.9	10	505.1	11	77.6	4	113.9	9	700.1	28	534.5	29	98.2	26	2,106.4	16
0.51-1.0	82.7	11	363.4	8	52.2	3	59.8	5	569.0	23	365.9	20	79.2	21	1,572.2	12
1.1-2.0	104.8	13	252.3	6	19.8	1	26.1	2	198.5	8	138.7	7	20.8	6	760.9	6
over 2	175.0	22	534.6	12	70.0	3	110.5	9	269.4	11	389.1	21	71.2	19	1,619.7	12
All	785.6	100	4,562.7	100	2,039.5	100	1,274.2	100	2,498.0	100	1,853.7	100	371.1	100	13,384.8	100

Note: Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

At the national level, one third of livestock in high-density areas were on very intensive farms compared with 8% in medium-density areas. In high-density areas, 66% of livestock were not on very intensive farms (less than 2 animal units per tillable acre). This illustrates that the cumulative effect of many non-intensive farms may be comparable to a few intensive farms (Figure 9a).

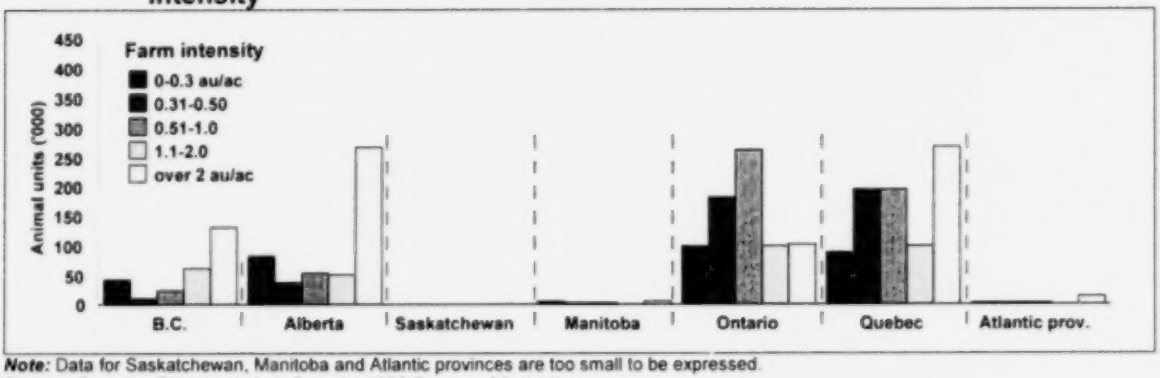
Figure 9a: Distribution of livestock, by livestock density and farming intensity, Canada



Source: Statistics Canada, derived from the 1996 Census of Agriculture.

In areas of high livestock densities, there were as many livestock on intensive farms in Alberta as in Quebec, followed by British Columbia and Ontario. In Quebec and Ontario's high-density areas, there were many more animals on non-intensive farms than on intensive farms. Livestock populations on non-intensive farms were also important in Alberta and British Columbia (Figure 9b).

Figure 9b: Distribution of livestock in high-density areas, by province and farming intensity



Note: Data for Saskatchewan, Manitoba and Atlantic provinces are too small to be expressed.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Analysis of livestock in high-density areas by farm size and farming intensity is presented in Appendix C Table C11. In Alberta, over half of livestock in high-density areas were on very large (over 400 animal units) intensive farms. In Quebec, British Columbia and Ontario, animals on intensive farms were more evenly distributed among different farm size groups. Over two-thirds (68%) of livestock in Ontario's high-density areas were on small (less than 200 animal units) non-intensive farms. In Quebec, they represented 57% of livestock in high-density areas. This demonstrates that it is preferable to consider all types of farms (whether small, large, non-intensive or intensive). The cumulative impact of several non-intensive small farms may be comparable to the impact of a few large intensive farms.

Conclusion

The long-term trend is a gradual decrease in the number of livestock farms and a steady increase in average farm size. Existing livestock farms and the new ones being established are becoming larger and more specialized. Large farms can be associated with large amounts of manure. A first reaction would be to think that environmental regulations and codes of practices should focus their attention on large livestock operations.

Initial research on livestock density cannot conclude that large livestock farms were solely responsible for high livestock densities in specific rural areas. The findings of this study indicate that livestock concentration is not always related to large livestock farms. Livestock in high-density areas were more likely to be on very large feedlot operations in Alberta, small dairy and pig farms in Quebec, and small dairy and beef cattle farms in Ontario.

Twelve percent of Canadian livestock were on very intensive farms. In Alberta high-density areas, most of the livestock were on very large intensive farms while, in Quebec and Ontario, they were on relatively smaller less intensive farms. The cumulative impact of several non-intensive small farms may be comparable to the impact of a few large intensive farms.

Additional research would be required before concluding whether or not the livestock concentration in certain regions has reached limits where it could pose an ecological threat. It would require establishing local or regional nutrient budgets based on the amounts of manure produced, farmland available for manure disposal, soil characteristics, crop requirements, and use of chemical fertilizer and municipal sewage sludge. This could help identify areas where the environment might be at risk from a lack of sufficient land to recycle animal waste.

References

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Appendix A – Algorithm used to determine cattle farm type

total cattle and calves = milk cows+beef cows+calves+heifer+steers+bulls;
total beef cows, steers and heifers = beef cows+heifer+steers;
total steers and heifers = heifer+steers;
total cattle = milk cows+beef cows+heifer+steers+bulls;

Determination of cattle class:

if total cattle and calves=0 then cattle class = "no cattle";
else if milk cows>0 and beef cows=0 then cattle class = "specialized dairy farm";
else if milk cows>20 and beef cows>0 then cattle class = "mixed dairy and beef farm";
else if (total beef cows, steers and heifers>0 and total beef cows, steers and heifers<9) or (beef cows>0 and total steers and heifers<beef cows*.8) then cattle class = "cow-calf";
else if (beef cows>0 and total steers and heifers>0 and total steers and heifers>=beef cows*.8 and total steers and heifers<beef cows*24) or (beef cows>50)then cattle class = "feeder with cow-calf";
else if (beef cows>0 and total steers and heifers>0 and total steers and heifers>=beef cows*24) or (total steers and heifers>=25 and total steers and heifers>total cattle*.9) then cattle class = "feed operation";
else if (bulls>0 and bulls>milk cows+beef cows)then cattle class = "bull farm";
else if total steers and heifers>100 then cattle class = "more 100 heifers & steers" ;
else cattle class = "mainly veal farm";

Determination of type of operation:

if cattle class= "no cattle" then Type of operation = "not a cattle farm";
else if cattle class = "specialized dairy farm" or "mixed dairy and beef farm" or "mainly veal farm" then Type of operation = "dairy farm";
else if cattle class = "cow-calf" or "bull farm" then Type of operation = "cow-calf";
else if cattle class = "feed operation" or "more 100 heifers & steers" then Type of operation = "feed operation";
else Type of operation = "other beef farm";

Appendix B – Distribution of livestock and number of farms, by livestock density and province

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
Animal units	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
less 3 au/km2	6.2	--	17.1	--	63.7	3.1	3.8	--	--	--	--	--	1.7	--	93.9	--
3-15	106.4	13.7	704.0	15.4	1,601.8	78.6	412.5	32.4	61.5	2.5	23.7	1.3	27.3	7.4	2,937.3	22.0
15.1-40	263.6	33.9	1,981.2	43.5	360.7	17.7	724.7	56.9	397.1	15.9	335.0	18.1	159.4	43.1	4,221.7	31.6
40.1-80	125.8	16.2	1,357.1	29.8	11.9	--	111.6	8.8	1,288.6	51.6	644.5	34.8	153.6	41.5	3,693.0	27.6
80.1-120	66.5	8.6	206.8	4.5	--	--	19.1	1.5	555.1	22.2	387.8	20.9	11.9	3.2	1,247.2	9.3
120.1-240	124.5	16.0	292.3	6.4	--	--	--	--	193.7	7.8	451.2	24.3	8.9	2.4	1,070.8	8.0
more 240	84.2	10.8	--	--	--	--	--	--	--	--	10.6	0.6	6.8	1.8	102.9	--
Total	777.2	100.0	4,558.5	100.0	2,038.5	100.0	1,272.7	100.0	2,496.9	100.0	1,853.3	100.0	369.6	100.0	13,366.8	100.0
Number of farms	nb.	%	nb.	%	nb.	%	nb.	%	nb.	%	nb.	%	nb.	%	nb.	%
less 3 au/km2	150	--	305	--	1,158	--	50	--	31	--	25	--	66	--	1,785	--
3-15	2,235	16.3	7,138	16.7	22,598	80.5	5,537	35.7	1,659	3.8	451	1.9	665	10.0	40,283	23.0
15.1-40	4,678	34.0	20,675	48.4	4,209	15.0	8,685	56.0	8,477	19.3	5,332	21.9	3,037	45.9	55,093	31.5
40.1-80	2,395	17.4	12,656	29.6	94	--	1,022	6.6	23,937	54.4	9,337	38.4	2,486	37.5	51,927	29.7
80.1-120	517	3.8	1,414	3.3	--	--	195	1.3	7,560	17.2	4,801	19.7	200	3.0	14,687	8.4
120.1-240	1,996	14.5	549	1.3	--	--	--	--	2,295	5.2	4,321	17.8	85	1.3	9,249	5.3
more 240	1,768	12.9	--	--	--	--	--	--	--	--	48	--	82	1.2	1,919	1.1
Total	13,739	100.0	42,744	100.0	28,064	100.0	15,498	100.0	43,962	100.0	24,315	100.0	6,621	100.0	174,943	100.0

Notes:
-- too small to be expressed.
Due to rounding, figures may not add up to totals.
Excludes data not recorded on the map to protect their confidentiality.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Appendix C – Livestock in high-density areas by farm size

Table C1: Livestock, by province, type of farm and farm size, May 1996

		B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
		'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Dairy																	
	1-99	14.2	5	2.3	--	-	-	1.3	6	102.2	14	182.1	22	1.9	7	303.9	13
	100-199	37.1	13	11.4	2	-	-	2.2	11	93.5	13	95.9	11	2.2	8	242.4	10
	200-299	17.7	6	8.4	2	-	-	-	-	16.8	2	16.8	2	1.2	4	61.8	3
	300-399	8.6	3	3.8	1	-	-	-	-	8.9	1	5.9	1	-	-	27.8	1
	400 & over	14.2	5	2.7	1	-	-	-	-	9.8	1	2.1	--	-	-	38.0	1
Cattle																	
	1-99	16.5	6	30.0	6	--	--	1.7	8	97.2	13	69.4	8	3.4	12	218.4	9
	100-199	7.5	3	29.5	6	--	--	--	-	45.6	6	18.3	2	--	--	101.9	4
	200-299	6.1	2	16.5	3	-	-	-	-	18.4	2	4.6	1	--	--	45.8	2
	300-399	3.0	1	13.3	3	-	-	--	--	8.7	1	3.9	--	-	-	30.0	1
	400 & over	41.3	15	301.4	66	-	-	--	--	30.2	4	15.0	2	-	-	418.6	17
Pig																	
	1-99	1.4	1	3.2	1	-	-	--	--	42.5	6	42.8	5	--	--	90.9	4
	100-199	2.7	1	5.4	1	--	--	1.9	9	47.6	6	87.8	10	1.0	4	146.4	6
	200-299	3.4	1	4.1	1	--	--	1.0	5	13.8	2	51.9	6	--	--	74.1	3
	300-399	2.5	1	--	--	--	--	--	--	8.8	1	34.1	4	-	-	48.2	2
	400 & over	4.1	1	8.9	2	-	-	-	-	17.9	2	78.8	9	-	-	111.9	5
Poultry																	
	1-99	6.2	2	--	-	-	-	--	--	10.6	1	7.5	1	--	--	25.7	1
	100-199	10.4	7	1.0	--	-	-	--	--	19.3	3	20.6	2	1.5	5	61.0	3
	200-299	14.0	5	--	--	-	-	--	--	16.0	2	20.0	2	1.9	7	54.9	2
	300-399	11.4	4	--	--	-	-	--	--	10.9	1	11.7	1	--	--	35.3	1
	400 & over	18.3	7	3.3	1	-	-	--	--	24.6	3	41.3	5	5.6	20	94.8	4
Other																	
	1-99	19.4	7	7.8	2	--	--	--	--	58.7	8	22.0	3	2.1	8	110.6	5
	100-199	1.8	1	2.9	1	-	-	--	--	29.6	4	9.2	1	1.2	4	44.9	2
	200-299	-	--	-	-	-	-	-	-	5.7	1	1.7	--	1.0	4	10.4	-
	300-399	--	--	--	--	--	--	--	-	1.4	--	--	--	--	--	6.5	-
	400 & over	2.7	1	7.4	1	--	--	--	-	7.8	1	--	--	--	--	19.9	1
	All	275.2	100	459.3	100	--	100	20.1	100	747.4	100	846.9	100	27.6	100	2 416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm type is based on major source of income.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Table C2: Cattle, by province, type of cattle farm and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Dairy																
1-99	14.7	9	3.0	1	-	-	1.3	13	119.2	24	189.0	41	1.8	18	329.0	21
100-199	37.3	22	11.7	3	-	-	2.1	20	110.2	22	107.2	24	2.3	23	270.8	17
200-299	17.5	10	9.1	2	-	-	--	--	21.1	4	21.2	5	1.2	12	70.9	4
300-399	8.9	5	4.6	1	-	-	--	--	9.9	2	8.6	2	-	-	33.0	2
400 & over	13.8	8	13.8	3	-	-	--	--	15.3	3	10.0	2	--	--	54.4	3
Cow-calf																
1-99	15.1	9	26.6	6	--	--	1.5	15	53.9	11	62.8	14	2.9	28	162.9	10
100-199	6.5	4	24.3	5	--	--	--	--	13.2	3	17.9	4	--	--	62.9	4
200-299	5.3	3	12.7	3	-	-	-	-	2.3	--	5.1	1	--	--	25.6	2
300-399	3.0	2	5.6	1	-	-	--	--	1.1	--	1.3	--	--	--	11.3	1
400 & over	16.4	10	7.0	2	-	-	-	-	1.8	--	1.9	--	--	--	27.3	2
Feedlots																
1-99	--	--	1.9	-	-	-	--	--	29.0	6	2.5	1	-	-	34.4	2
100-199	--	--	1.6	-	-	-	--	--	28.2	6	1.9	--	-	-	31.7	2
200-299	--	--	1.9	-	-	-	--	--	12.3	2	1.1	--	-	-	15.5	1
300-399	--	--	4.3	1	-	-	-	-	6.5	1	3.1	1	-	-	14.2	1
400 & over	--	--	262.3	58	-	-	--	--	20.7	4	10.8	2	-	-	294.8	18
Other																
1-99	3.3	2	3.0	1	-	-	--	--	28.7	6	6.6	1	0.8	8	42.5	3
100-199	1.0	1	3.8	1	-	-	--	--	13.0	3	2.3	1	--	--	20.4	1
200-299	--	--	2.4	1	-	-	-	-	3.6	1	--	--	-	-	7.8	--
300-399	--	--	3.1	1	-	-	--	--	1.3	--	--	--	--	--	5.6	--
400 & over	23.0	14	52.4	12	-	-	--	--	5.1	1	--	--	--	--	82.6	5
All	169.2	100	455.2	100		100	10.3	100	496.6	100	455.9	100	10.2	100	1,597.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Includes only beef and dairy cattle. Does not include other livestock that may be held on these farms.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Table C3: Livestock, by province, operating arrangement and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Sole proprietor																
1-99	23.3	8	25.0	5	--	--	2.4	12	160.9	22	150.3	18	5.2	19	367.3	15
100-199	11.4	4	25.2	5	-	-	1.6	8	82.0	11	54.3	6	2.4	9	176.9	7
200-299	3.5	1	11.4	2	-	-	--	--	16.8	2	17.9	2	--	--	50.7	2
300-399	2.1	1	5.7	1	-	-	1.4	7	9.1	1	7.1	1	-	-	25.3	1
400 & over	4.3	2	44.2	9	-	-	-	-	9.0	1	10.1	1	-	-	67.5	3
Family corporation																
1-99	9.7	4	4.2	1	--	--	--	--	25.6	3	53.8	6	--	--	94.6	4
100-199	36.6	13	8.9	2	-	-	1.0	5	58.4	8	92.4	11	2.2	8	199.4	8
200-299	29.4	11	9.1	2	-	-	1.0	5	32.6	4	46.8	6	2.3	8	121.1	5
300-399	19.2	7	6.1	1	-	-	--	--	19.9	3	28.4	3	1.8	7	76.1	3
400 & over	49.0	18	183.0	37	-	-	3.4	17	51.3	7	71.6	8	6.4	23	364.7	15
Non-family corporation																
1-99	1.4	1	--	-	-	-	--	--	3.0	--	12.7	1	--	--	17.8	1
100-199	2.2	1	1.1	-	-	-	-	-	4.6	1	20.7	2	--	--	29.0	1
200-299	2.5	1	--	--	-	-	-	-	3.7	--	14.1	2	--	--	21.3	1
300-399	2.0	1	--	--	-	-	-	-	3.4	--	12.2	1	-	-	18.7	1
400 & over	18.2	7	78.5	16	-	-	--	--	22.2	3	46.5	5	1.0	4	167.1	7
Other																
1-99	23.4	9	14.5	3	-	-	2.1	10	121.6	16	107.0	13	1.3	5	269.9	11
100-199	17.3	6	15.2	3	--	--	2.3	11	90.8	12	64.4	8	1.3	5	191.4	8
200-299	7.1	3	10.0	2	-	-	1.2	6	18.4	2	16.2	2	--	--	53.9	2
300-399	3.6	1	7.5	2	-	-	--	--	6.3	1	9.9	1	--	--	28.2	1
400 & over	9.0	3	47.8	10	-	-	--	--	8.0	1	10.6	1	--	--	76.0	3
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2,416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Table C4: Livestock, by province, number of operators and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
One operator																
1-99	27.9	10	25.7	5	..	..	2.6	13	172.6	23	154.6	18	5.8	21	389.5	16
100-199	28.7	10	27.9	6	..	..	1.6	8	104.8	14	80.4	9	3.9	14	247.4	10
200-299	19.2	7	13.9	3	-	-	1.0	5	28.4	4	34.4	4	1.6	6	98.5	4
300-399	13.0	5	9.5	2	-	-	1.4	7	20.0	3	22.6	3	..	..	67.6	3
400 & over	56.8	21	268.3	54	-	-	2.0	15	52.7	7	88.3	10	..	..	471.9	20
Two operators																
1-99	26.9	10	16.4	3	-	-	2.0	10	124.3	17	146.0	17	1.6	6	317.3	13
100-199	29.7	11	19.9	4	-	-	2.9	14	101.5	14	106.1	13	1.6	6	260.5	11
200-299	16.3	6	14.4	3	-	-	1.5	7	29.8	4	40.3	5	1.9	7	104.2	4
300-399	10.2	4	8.7	2	-	-	..	..	12.6	2	26.1	3	-	-	59.6	2
400 & over	13.9	5	49.2	10	-	-	..	..	18.1	2	29.5	3	-	-	113.9	5
Three operators																
1-99	3.0	1	1.9	-					14.3	2	23.2	3			42.9	2
100-199	9.2	3	3.6	1					29.3	4	45.2	5			88.7	4
200-299	7.0	3	2.7	1					13.3	2	20.3	2			44.2	2
300-399	3.9	1	2.1	-					5.9	1	8.9	1			21.2	1
400 & over	9.8	4	36.1	7					19.6	3	20.9	2			89.4	4
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2 416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Table C5: Livestock, by province, intensity of work off-farm and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
more 40 hrs/week																
1-99	12.3	4	9.9	2	-	-	1.1	5	42.2	6	21.6	3	1.1	4	88.2	4
100-199	6.5	2	4.6	1	-	-	..	..	15.9	2	10.9	1	..	..	38.6	2
200-299	3.9	1	2.1	..	-	-	..	..	5.6	1	3.3	..	..	..	15.8	1
300-399			..	..	-	-	..	..	3.5		2.8		..	..	7.0	
400 & over	5.7	2	19.6	4	-	-	..	..	3.6		5.9	1	2.5	9	37.3	2
20-40 hrs/week																
1-99	11.8	4	7.8	2	-	-	..	..	43.0	7	36.1	4	1.8	7	107.4	4
100-199	10.0	4	5.6	1	-	-	..	..	18.8	3	15.3	2	..	..	49.9	2
200-299	3.9	1	2.6	1	-	-	-	-	5.8	1	7.1	1	..	..	19.6	1
300-399	1.7	1	..	..	-	-	-	-	..	..	2.1	..	-	-	7.9	.
400 & over	2.3	1	5.7	1	-	-	-	-	..	.	9.9	1	..	..	28.8	1
less 20 hrs/week																
1-99	33.7	12	26.3	5			3.2	16	213.9	29	266.1	31	4.6	17	554.0	23
100-199	51.1	19	40.1	8			4.5	22	201.0	27	205.6	24	5.6	20	508.1	21
200-299	34.7	13	26.3	5			2.5	12	68.0	9	84.7	10	3.3	12	211.5	9
300-399	25.2	9	17.9	4			2.8	14	32.6	4	52.7	6	2.1	8	133.5	6
400 & over	72.4	26	328.2	66	-	-	4.7	23	65.3	11	122.9	15	3.6	13	617.0	26
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2 416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Table C6: Livestock, by province, percentage of land rented and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
10% and less																
1-99	39.3	14	28.1	6	-	-	3.3	16	201.8	27	253.3	30	5.3	19	531.1	22
100-199	40.4	15	27.6	6	--	--	2.5	12	123.0	16	168.2	20	4.1	15	365.9	15
200-299	27.9	10	16.8	3	-	-	1.6	8	36.5	5	69.6	8	3.5	13	155.9	6
300-399	17.4	6	10.8	2	-	-	1.4	7	21.5	3	42.7	5	2.1	8	95.8	4
400 & over	50.6	18	227.9	46	-	-	3.0	15	52.3	7	103.2	12	7.4	27	444.4	18
>10%-30%																
1-99	3.5	1	2.7	1	-	-	--	--	36.8	5	32.6	4	1.3	5	77.2	3
100-199	7.5	3	6.2	1	-	-	--	--	40.7	5	31.3	4	1.4	5	87.8	4
200-299	4.5	2	4.7	1	-	-	-	-	11.7	2	10.9	1	--	--	31.9	1
300-399	3.7	1	3.7	1	-	-	--	--	7.8	1	4.5	1	-	-	20.3	1
400 & over	6.8	2	64.7	13	-	-	-	-	16.4	2	12.1	1	-	-	100.0	4
>30%-50%																
1-99	4.2	2	4.1	1	-	-	--	--	33.7	5	22.0	3	--	--	65.1	3
100-199	10.4	4	6.8	1	-	-	--	--	38.3	5	19.0	2	--	--	75.8	3
200-299	5.0	2	3.2	1	-	-	--	--	13.6	2	6.9	1	--	--	29.4	1
300-399	2.0	1	2.8	1	-	-	-	-	3.7	-	5.1	1	-	-	13.6	1
400 & over	13.4	5	34.1	7	-	-	1.7	8	9.3	1	15.6	2	-	-	74.0	3
over 50%																
1-99	10.7	4	9.2	2	--	--	--	--	38.9	5	15.9	2	--	--	76.2	3
100-199	9.2	3	9.8	2	-	-	--	--	33.7	5	13.4	2	--	--	67.2	3
200-299	5.0	2	6.3	1	-	-	--	--	9.6	1	7.7	1	--	--	29.6	1
300-399	3.8	1	3.1	1	-	-	--	--	5.7	1	5.4	1	-	-	18.7	1
400 & over	9.6	3	26.9	5	-	-	-	-	12.5	2	7.9	1	-	-	56.7	2
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2,416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture

Table C7: Livestock, by province, manure spreading method and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Solid spreader																
1-99	23.5	13	18.9	5	-	-	1.3	13	226.6	34	160.5	25	5.2	38	444.0	23
100-199	14.6	8	23.2	6	-	-	1.8	18	123.0	18	54.6	8	2.1	15	219.3	11
200-299	10.1	5	13.8	4	-	-	-	-	26.1	4	11.1	2	1.5	11	65.4	3
300-399	5.5	3	12.6	3	-	-	-	-	11.0	2	9.2	1	-	-	40.1	2
400 & over	35.5	19	258.1	65	-	-	-	-	17.6	2	14.0	1	-	-	328.9	17
Irrigation																
1-99	--	--	--	--	-	-	-	-	3.9	1	3.9	1	-	-	8.3	-
100-199	-	-	--	--	-	-	-	-	5.4	1	7.8	1	-	-	13.2	1
200-299	--	--	--	--	-	-	-	-	2.3	-	5.8	1	-	-	8.3	-
300-399	-	-	-	-	-	-	-	-	1.6	-	3.5	1	-	-	5.1	-
400 & over	--	--	--	--	-	-	-	-	7.6	1	7.6	1	-	-	16.3	1
Liquid spreader																
1-99	7.9	4	1.4	-	-	-	-	-	13.1	2	17.6	5	-	-	39.6	2
100-199	17.5	10	5.3	1	-	-	1.2	9	27.7	4	53.7	8	-	-	109.1	5
200-299	9.6	5	2.3	1	-	-	-	-	6.3	1	27.8	4	-	-	45.5	2
300-399	4.5	2	-	-	-	-	-	-	4.9	1	17.6	3	-	-	28.6	1
400 & over	6.7	4	4.6	1	-	-	-	-	8.9	1	23.2	3	-	-	43.9	2
Manure combination																
1-99	4.7	3	2.0	1	-	-	-	-	39.0	6	80.1	12	-	-	126.9	6
100-199	17.2	9	7.2	2	-	-	1.9	9	69.9	10	79.2	12	1.1	8	175.7	9
200-299	10.9	6	6.8	2	-	-	-	-	28.2	4	26.2	4	-	-	72.9	4
300-399	5.5	3	4.3	1	-	-	-	-	15.6	2	10.4	2	-	-	39.7	2
400 & over	10.9	6	30.3	8	-	-	-	-	40.7	6	28.6	4	-	-	112.3	6
All	184.1	100	390.7	100	1.9	100	13.9	100	688.5	100	679.7	100	13.6	100	1,964.0	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture

Table C8: Livestock, by province and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
Farm size (animal units)																
1-99	57.8	21	44.1	9	--	--	5.0	25	311.2	42	323.8	38	7.6	28	749.6	31
100-199	67.6	25	50.3	10	--	--	4.9	24	235.7	32	231.8	27	6.3	23	596.6	25
200-299	42.4	15	31.0	6	-	-	2.8	14	71.5	10	95.0	11	4.3	16	246.9	10
300-399	27.0	10	20.3	4	-	-	2.8	14	38.7	5	57.6	7	2.1	8	148.4	6
400 & over	80.5	29	353.6	71	-	-	4.7	23	90.4	12	138.7	16	7.4	27	675.2	28
Total	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2,416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture

Table C9: Livestock, by province, farm size and farm area, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
1-99 au																
1-99 ac.	46.9	17	8.3	2	--	--	1.7	8	64.4	9	55.1	7	1.7	6	178.2	7
100-274	6.3	2	13.6	3	-	-	1.6	8	204.5	27	183.3	22	2.7	10	411.9	17
275-699	3.2	1	14.6	3	--	--	1.3	6	39.0	5	82.9	10	2.8	10	143.9	6
700-2,249	--	--	7.1	1	-	-	--	--	3.2	--	2.4	--	--	--	14.5	1
2,250 & over	--	--	--	--	-	-	-	-	--	--	--	--	-	-	--	--
100-199 au																
1-99 ac.	27.7	14	4.3	1	-	-	--	--	26.3	4	48.6	6	2.0	7	119.5	5
100-274	21.9	8	10.6	2	-	-	--	--	114.8	15	79.7	9	1.1	4	228.5	9
275-699	3.0	1	19.5	4	--	--	3.3	16	85.4	11	93.2	11	2.9	11	207.3	9
700-2,249	4.4	2	14.3	3	-	-	--	--	8.9	1	10.2	1	--	--	38.7	2
2,250 & over	--	--	--	--	-	-	-	-	--	--	--	--	-	-	2.7	--
200-299 au																
1-99 ac.	21.4	8	2.5	1	-	-	--	--	13.6	2	30.1	4	2.3	8	71.1	3
100-274	14.5	5	4.3	1	-	-	--	--	15.7	2	25.8	3	--	--	61.5	3
275-699	3.0	1	10.0	2	-	-	--	--	32.5	4	29.3	3	--	--	75.7	3
700-2,249	2.4	1	11.9	2	-	-	--	--	9.2	1	9.8	1	--	--	34.6	1
2,250 & over	--	--	2.3	--	-	-	-	-	--	--	-	-	--	--	4.1	--
300-399 au																
1-99 ac.	13.8	5	--	--	-	-	--	--	7.0	1	18.5	2	1.4	5	41.8	2
100-274	8.2	3	2.1	--	-	-	--	--	9.5	1	16.5	2	--	--	37.7	2
275-699	1.9	1	6.2	1	-	-	--	--	14.5	2	15.0	2	-	-	38.1	2
700-2,249	2.4	1	9.5	2	-	-	--	--	7.6	1	7.7	1	-	-	27.9	1
2,250 & over	--	--	1.8	--	-	-	--	--	-	-	-	-	-	-	2.9	--
400 au & over																
1-99 ac.	26.5	10	5.0	1	-	-	--	--	16.7	2	54.0	6	5.0	18	108.2	4
100-274	8.6	3	23.3	5	-	-	--	--	6.8	1	31.2	4	--	--	71.2	3
275-699	6.6	2	127.5	26	-	-	--	--	17.6	2	36.3	4	--	--	190.5	8
700-2,249	6.6	2	84.2	17	-	-	--	--	43.2	6	17.2	2	--	--	153.1	6
2,250 & over	32.1	12	113.6	23	-	-	--	--	--	--	-	-	-	-	152.2	6
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2,416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Table C10: Livestock, by province, farm size and value of land and buildings, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
1-99 au																
under $150k	3.9	1	7.5	2	--	--	1.5	7	27.0	4	77.1	9	3.3	12	120.3	5
150-249	4.5	2	9.2	2	-	-	--	--	56.8	8	98.4	12	2.0	7	171.8	7
250-499	16.2	6	14.8	3	--	--	1.7	8	149.3	20	105.3	12	1.9	7	289.2	12
500-1,249	26.3	10	9.3	2	-	-	--	--	69.0	9	41.2	5	--	--	147.6	6
$1,250 & over	6.9	3	2.7	1	-	-	-	-	9.1	1	1.9	--	--	--	20.7	1
100-199 au																
under $150k	1.6	1	2.9	1	-	-	-	-	5.7	1	14.4	2	1.2	4	25.8	1
150-249	1.4	1	3.7	1	--	--	--	--	10.0	1	33.9	4	0.9	3	50.3	2
250-499	7.7	3	14.3	3	-	-	1.9	9	78.0	10	96.1	11	2.3	8	200.4	8
500-1,249	37.5	14	24.6	5	-	-	2.6	13	116.3	16	79.6	9	1.7	6	262.3	11
$1,250 & over	19.3	7	4.7	1	-	-	-	-	25.6	3	7.9	1	--	--	57.8	2
200-299 au																
under $150k	--	--	--	--	-	-	--	--	2.5	--	3.7	--	--	--	9.7	--
150-249	--	--	--	--	-	-	-	-	1.6	--	4.2	--	--	--	8.6	--
250-499	3.8	1	4.0	1	-	-	--	--	9.2	1	29.2	3	1.5	5	48.5	2
500-1,249	17.6	6	17.9	4	-	-	--	--	35.8	5	45.9	5	2.5	9	120.9	5
$1,250 & over	18.4	7	6.2	1	-	-	--	--	22.4	3	11.9	1	-	-	59.2	2
300-399 au																
under $150k	--	--	-	-	-	-	-	-	--	--	--	--	--	--	2.7	--
150-249	2.0	1	--	--	-	-	-	-	--	--	--	--	--	--	5.5	--
250-499	2.3	1	2.9	1	-	-	--	--	4.3	1	10.9	1	-	-	21.0	1
500-1,249	8.1	3	8.7	2	-	-	--	--	16.3	2	33.5	4	--	--	68.9	3
$1,250 & over	14.2	5	8.1	2	-	-	--	--	16.8	2	10.5	1	-	-	50.3	2
400 au & over																
under $150k	-	-	--	--	-	-	--	--	--	--	2.2	--	-	-	6.5	--
150-249	--	--	--	--	-	-	--	--	--	--	3.5	--	--	--	13.9	1
250-499	5.0	2	11.3	2	-	-	--	--	--	--	16.0	2	--	--	35.6	1
500-1,249	28.4	10	106.1	21	-	-	-	-	21.0	3	57.1	7	4.4	16	217.0	9
$1,250 & over	45.7	17	226.3	45	-	-	--	--	66.0	9	60.0	7	--	--	402.2	17
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2,416.7	100

Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

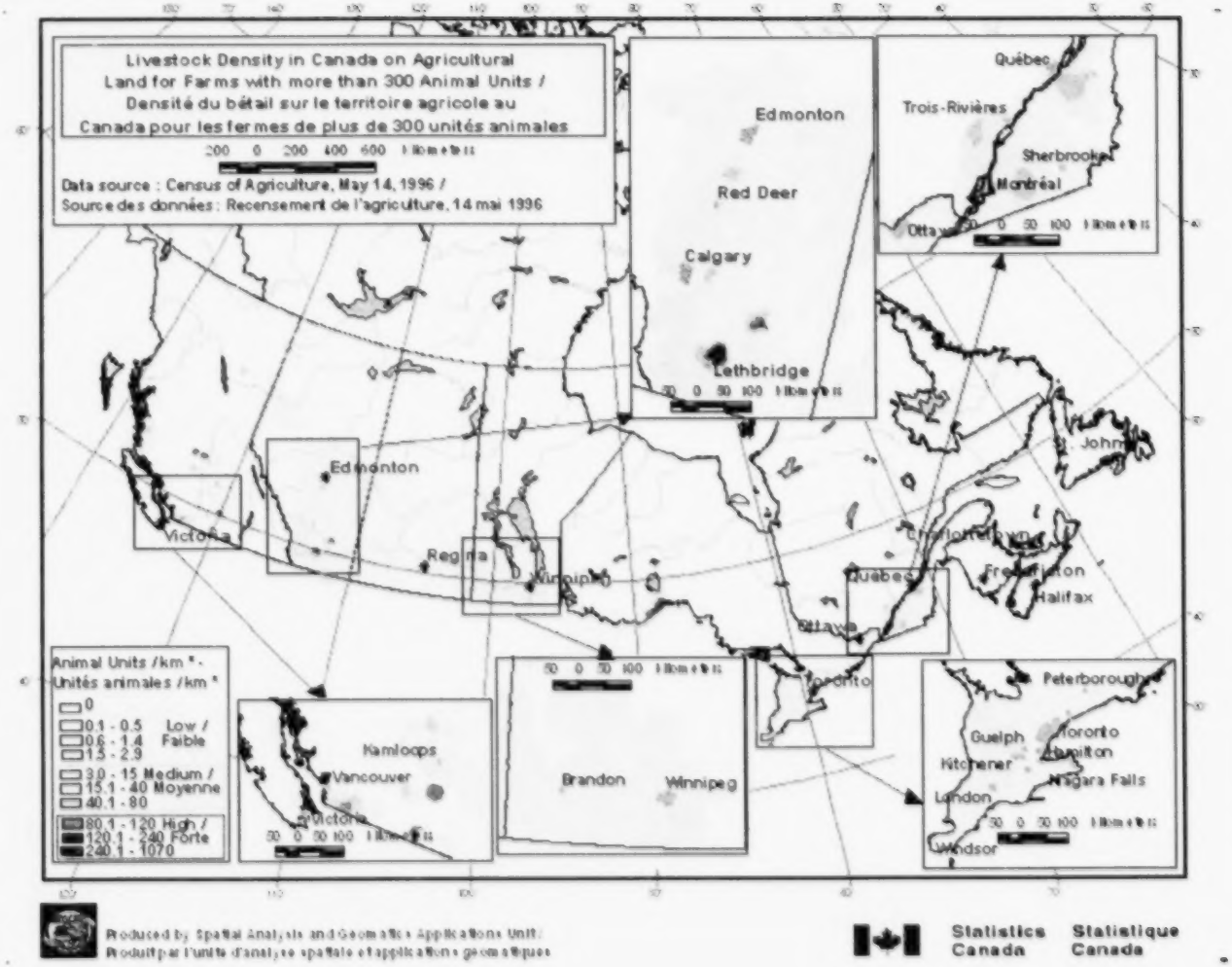
Table C11: Livestock, by province, farming intensity and farm size, May 1996

	B.C.		Alberta		Saskatchewan		Manitoba		Ontario		Quebec		Atlantic prov.		Canada	
	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%	'000AU	%
0-0.3 au/ac																
1-99	7.7	3	28.4	6	--	--	2.3	11	71.9	10	69.8	8	2.6	9	182.7	8
100-199	5.5	2	23.4	5	--	--	1.6	8	19.5	3	14.8	2	--	--	65.4	3
200-299	2.7	1	12.0	2	-	-	--	--	5.0	1	3.6	--	-	-	23.7	1
300-399	1.7	1	7.1	1	-	-	--	--	2.0	--	--	--	-	-	13.2	1
400 & over	27.5	10	14.3	3	-	-	--	--	--	--	-	-	-	-	42.9	2
0.31-0.5																
1-99	5.3	2	6.9	1	-	-	--	--	100.2	13	125.1	15	1.8	7	240.1	10
100-199	1.6	1	7.8	2	-	-	1.8	9	55.5	7	55.1	7	1.1	4	122.9	5
200-299	1.5	1	6.5	1	-	-	-	-	12.0	2	10.9	1	--	--	31.7	1
300-399	--	--	3.8	1	-	-	--	--	5.1	1	3.8	--	-	-	13.5	1
400 & over	--	--	13.2	3	-	-	-	-	9.2	1	--	--	-	-	25.4	1
0.51-1.0																
1-99	11.5	4	4.5	1	-	-	--	--	107.3	14	81.9	10	1.3	5	207.4	9
100-199	5.7	2	10.9	2	-	-	--	--	93.5	13	73.6	9	1.7	6	186.0	8
200-299	2.5	1	6.1	1	-	-	--	--	24.7	3	21.7	3	--	--	55.7	2
300-399	2.4	1	3.7	1	-	-	--	--	10.2	1	9.2	1	-	-	25.8	1
400 & over	2.3	1	29.2	6	-	-	--	--	27.1	4	8.3	1	-	-	68.1	3
1.1-2.0																
1-99	15.1	5	1.4	--	-	-	--	--	16.0	2	17.5	2	--	--	50.5	2
100-199	25.1	9	4.1	1	-	-	--	--	46.6	6	31.0	4	--	--	107.1	4
200-299	10.5	4	3.6	1	-	-	--	--	11.7	2	15.8	2	-	-	42.1	2
300-399	4.8	2	3.5	1	-	-	--	--	8.6	1	14.1	2	-	-	31.4	1
400 & over	8.1	3	40.5	8	-	-	-	-	17.4	2	20.9	2	--	--	88.0	4
over 2 au/ac																
1-99	18.3	7	2.8	1	--	--	--	--	15.9	2	29.6	3	1.5	5	69.0	3
100-199	29.7	11	4.2	1	-	-	--	--	20.5	3	57.3	7	2.9	11	115.3	5
200-299	25.3	9	2.8	1	-	-	1.6	8	18.1	2	43.0	5	3.1	11	93.8	4
300-399	17.6	6	2.1	--	-	-	1.1	5	12.8	2	28.8	3	2.1	8	64.5	3
400 & over	40.4	15	256.4	51	-	-	3.0	15	36.0	5	108.7	13	6.3	23	450.8	19
All	275.2	100	499.3	100		100	20.1	100	747.4	100	846.9	100	27.6	100	2,416.7	100

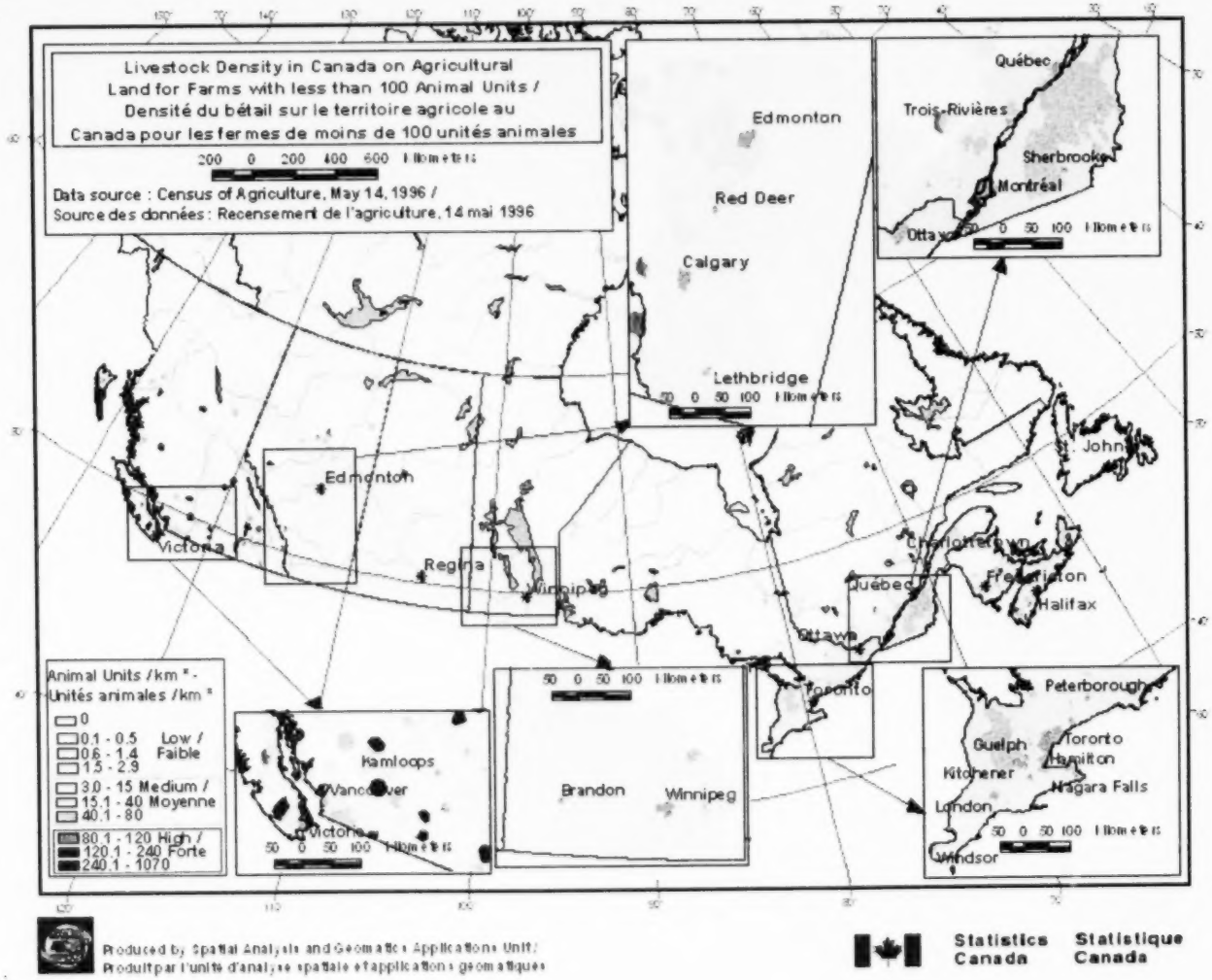
Notes:
- nil or zero.
-- too small to be expressed.
Farm size is based on number of animal units.
Due to rounding, figures may not add up to totals.
Source: Statistics Canada, derived from the 1996 Census of Agriculture.

Appendix D – Maps

Map D1: Livestock density on large farms



Map D2: Livestock density on small farms



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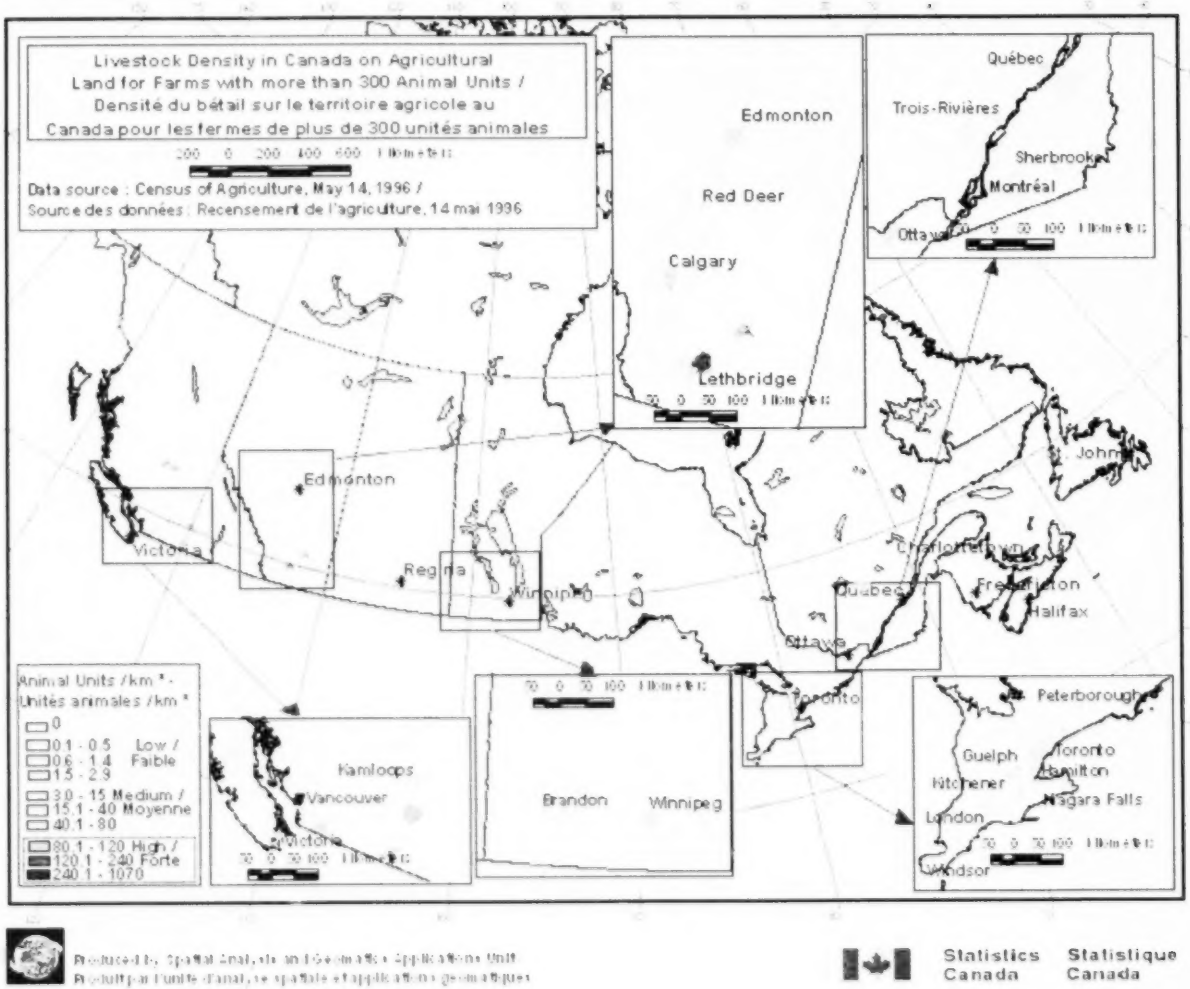
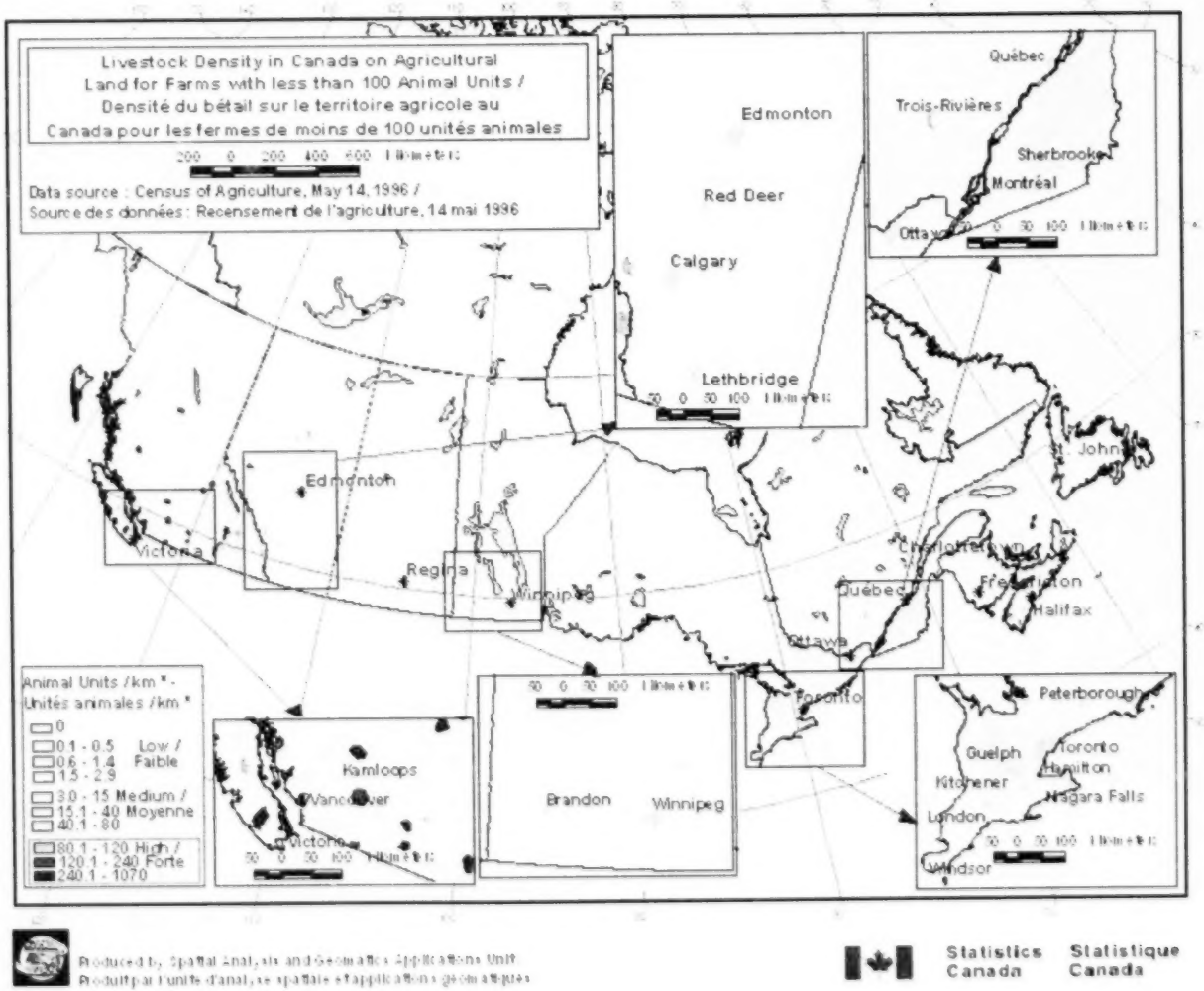


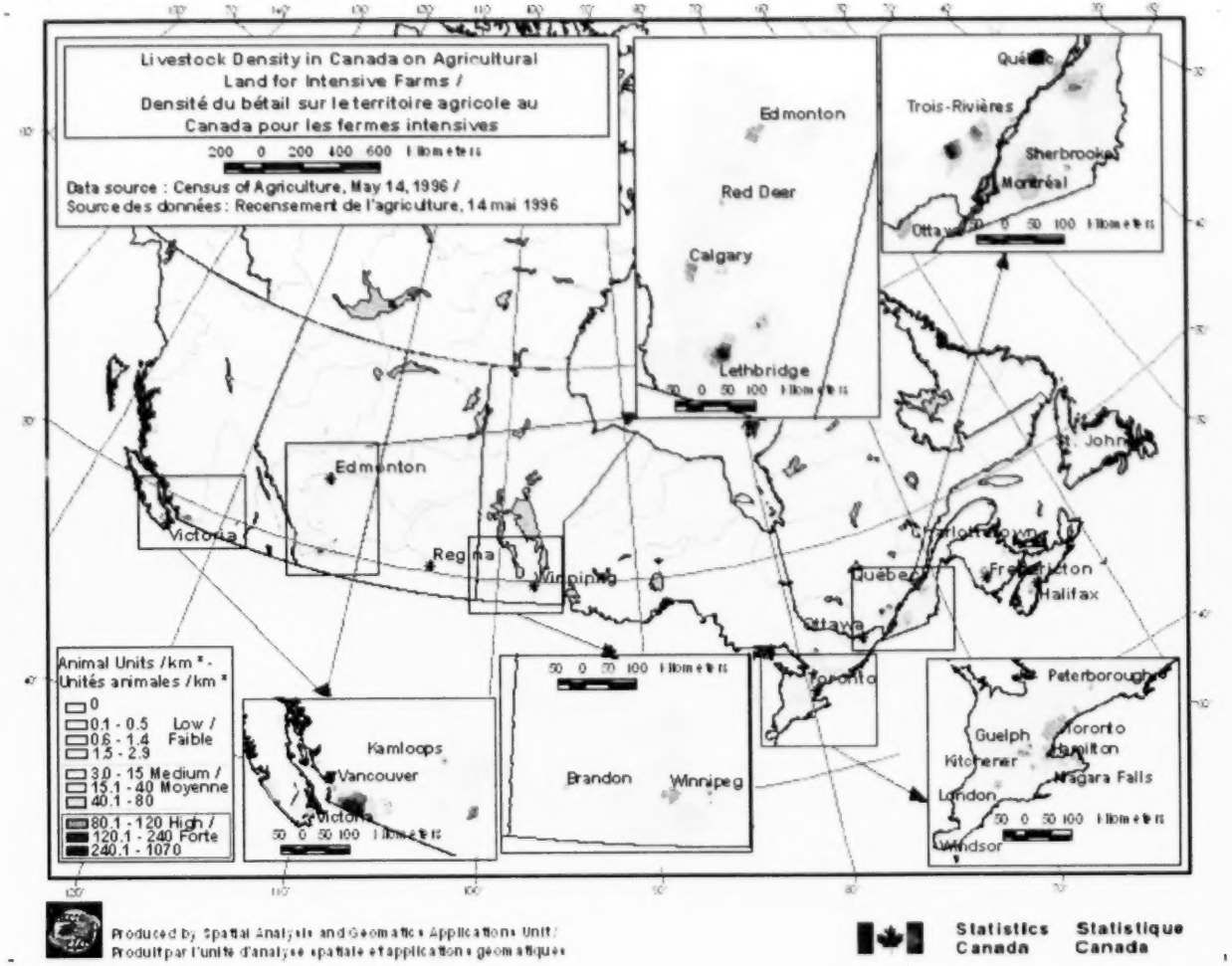
Produced by Spatial Analysis and Geomatics Applications Unit
Produit par l'Unité d'analyse spatiale et applications géomatiques

Statistics Canada Statistique Canada

Map D2: Livestock density on small farms



Map D3: Livestock density on intensive farms
(over 2 animal units/tillable acre)



Map D3: Livestock density on intensive farms
(over 2 animal units/tillable acre)